THE IRON AGE

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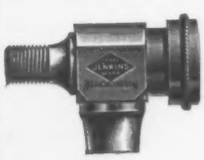

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THE IRON AGE

New York, Thursday, September 16, 1909.

Pig Iron Production in an Electric Shaft Furnace.

Investigations in Sweden by Dr. Eugene Haanel, Canadian Director of Mines.

Following his reports on electric smelting of iron ores published in 1904, 1906 and 1907, Dr. Eugene Haanel, Canadian Director of Mines, has just published in pamphlet form a "Report on the Investigation of an Electric Shaft Furnace at Domnarfvet, Sweden." It will be recalled that Dr. Haanel went as a representative of his government to Sweden in December, 1908, to study the latest developments of electric smelting of iron ores. The trip was made on the invitation of three Swedish engineers—Assar Grönwall, Axel Lindblad and Otto Stalhane—who had been working with apparent success on the problem of designing and constructing a commercial electric furnace. They were assisted by the iron masters of Sweden, particularly by E. J. Ljungberg, director, and Lars Yngström, vice-director, of the principal industrial company in Sweden, the Stora Kopparbergs Bergslags Aktiebolag. The inventors made an agreement with this company and the Trafikaktiebolaget Grangesberg-Oxelösund, the latter owning the largest iron ore deposits in Sweden, to carry on smelting experiments on a large scale at the Domnarfvet Iron Works of the former company. A company was formed by the inventors, called the Aktiebolaget Elektrometall, to which the patent rights were assigned. The construction of the specially designed electrical machinery and the preliminary work necessary for the building of the company's furnace were commenced in April, 1906. Toward the end of that year, when the installation of the elec-

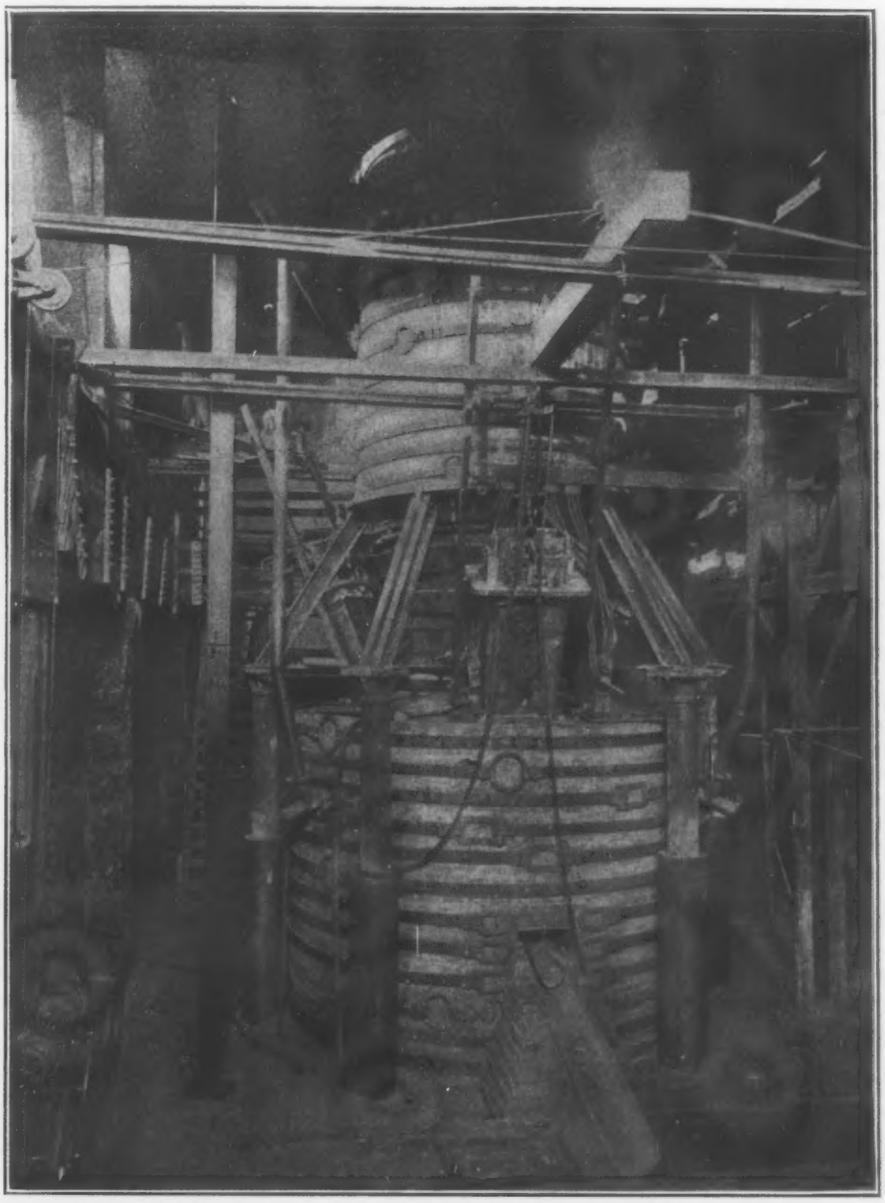


Fig. 1.—Electric Shaft Furnace for Smelting Iron Ore at Domnarfvet, Sweden.

trical machinery and high tension cables was completed, the construction of the first electric shaft furnace was begun. It was put in operation in April, 1907. In 1908 a new furnace was built as the result of the experimental work of the previous year. It had a larger capacity than the original one and a higher and better designed shaft. Dr. Haanel's investigations covered the early runs made by this furnace. Below are given extracts from his report and in other cases synopses of his description and data.

The Electric Plant.

The experimental plant was installed in an old building adjoining the basic Bessemer converter house. The machinery, which was specially designed and constructed for the experimental trials, consists of a three-phase synchronous motor of about 900 hp., supplied with a current of 7000 volts and 60 periods from a three-phase cable line in the iron works. This motor is directly coupled to a three-phase generator, which supplies current of 25 periods, adjustable to between 300 and 1200 volts, through small intervals to the transformers erected in the immediate vicinity of the furnace. By means of this extensive regulation it is possible to determine the most suitable voltage to be employed with furnaces of different construction and operating under various conditions. The fields of both the synchronous motor and the generator are fed with current at a tension of 220 volts, from a direct current generator, 20 kw. capacity, directly coupled to the system. For starting the system a three-phase synchronous motor directly coupled is employed. This is fed with a current stepped down to 500 volts.

From the switchboard the current is conducted through copper bars laid in cement channels to the three-phase transformers. The capacity of these transformers is 1500 k.v.a., and their ratio of transformation 14:1. By regulating the tension of the generator the low tension sides of the transformers can be altered through small intervals from 20 to 85 volts. The ratio of transformation can be altered to 7:1 by means of certain easily performed changes of coupling in the transformers, in which case the low tension can be varied between 40 and 170 volts. The transformers are cooled with air supplied under pressure by two electric blowers.

A switchboard is situated conveniently near the furnace for controlling its operation; on it are mounted the following instruments: One three-phase precision watt meter for differently loaded phases, three ampere meters, one for each phase, and one volt meter.

The ampere meters and the watt meter are connected to the current sysytem by means of transformers. The volt meter and tension terminals of the watt meter are directly connected to two of the conducting bars.

To protect these instruments from heat when tapping, an iron curtain, which may be lowered or raised, is placed in front of the switchboard. The wheels by which the electrodes are adjusted are placed under the instruments in such a manner that the wheel and ampere meter opposite each other belong to the same phase.

Description of Electric Shaft Furnace.

In general appearance this electric shaft furnace is unlike any hitherto constructed, being very similar in design to an ordinary blast furnace in which the tuyeres are replaced by electrodes. A photographic view is given in Fig. 1. A vertical section of the furnace is represented by Fig. 2, and Fig. 3 shows a top view, with the shaft and electrodes removed. The hight of the furnace above ground level is about 25 ft. The melting chamber or crucible containing the electrodes is about 7 ft. high and is of greater diameter than any other part. The shaft is about 18 ft. high, the lower end of which for about 4 ft. has the form of a truncated cone, for the purpose of directing the charge into the crucible in such a manner that the electrodes, lining and descending charge could not come in contact. This special feature in the disgn was introduced by the inventors after repeated experiments which demonstrated that the upper surface of the column formed by the materials charged into the furnace assumes a definite angle—viz., 50 to 55 degrees to the vertical—when the materials, crushed to normal size and at the same temperature as that existing in the melting chamber, are allowed to fall through a circular aperture into a free space. In Fig. 2 the slope is indicated by dotted lines.

It is this isolation of the descending charge from the lining at the point where the electrode enters the furnace that constitutes the particular economic advantage of the construction, since it prevents the destruction of the lining, which occurred in all previous furnaces where the electrode came directly in contact with the melting charge and the lining. The temperature of the brickwork in close proximity to the electrodes becomes so great that the most refractory lining materials are rapidly destroyed, even when the electrodes are cooled by water jackets.

The contracted neck of the shaft immediately over the central opening into the melting chamber is not supported by the arched roof, but the entire weight of the shaft is carried by six cast iron columns arranged symmetrically around the furnace hearth. The melting chamber is made in the form of a crucible and is covered with an arched roof provided with openings for the reception of the electrodes and descending charge. The roof and walls of the crucible are lined with magnesite. For the purpose of cooling the brickwork composing the lining of the roof of the melting chamber, and thereby increasing its life, three tuyeres are introduced into the crucible just above the melting zone, through which the comparatively cool, tunnel head gases* are forced against the lining of the roof into the free spaces. This gas absorbs heat from the exposed lining of the roof and walls and the free surface of the spreading charge, thus effectively lowering the temperature of the roof and exposed walls.

With the exception, however, of radiation from the tuyeres, no heat is lost by this method of cooling or lowering of temperature, since the heat given up by the lining of roof and wall to the comparatively cool gas introduced through the tuyeres is imparted in passing upward through the shaft to the cooler portions of the descending charge. This effects not only a better utilization of the reducing power of the CO, but in addition produces a better distribution of heat throughout the charge in the shaft than in any electric furnaces previously constructed.

The tuyeres are provided with sight holes covered with mica, through which the interior surface of the arched roof can be observed. By means of this device it is possible to determine approximately the necessary quantity of gas required to effectively cool the roof lining at the mouth of the melting chamber.

Each electrode was built up from two carbons 11 in. square × 63 in. long, making the total cross section of the built up electrode 11 in. × 22 in. The electrode holder is made of a strong steel frame, forming a support for the wedges, by means of which the copper plates conducting the current from the copper cables are pressed against the faces of the electrode. The electrode is clamped in the steel frame mentioned above and slides on two guides, which serve the twofold purpose of keeping the angle of inclination to the vertical constant and relieving the arched roof of any undue strain which would arise from the weight of the electrode, if insufficiently supported. A steel cable, secured to the top of the electrode holder and passing over a system of guide wheels or pulleys to the drum operated by the hand wheel on the switchboard, serves to lower and raise the electrode by winding or unwinding the drum. The wheels for regulating the electrodes are shown at the left in Fig. 1. In order to protect the parts of the electrodes outside the furnace from the oxidizing action of the air, a suitable covering is provided. The water cooled stuffing boxes, through which

* During the run of the furnace now in progress (July 7, 1909), an examination of the tunnel-head gases was made, resulting as under. The escaping gases were kept (by regulating the circulation) at a temperature of 200 to 300 degrees, and the following is an analysis when using—

Hematite:	Per cent.	Magnetite:	Per cent.
CO_2	40	CO_2	25
CO	50	CO	65
H	10	H	10

the electrodes enter the melting chamber, are provided with special devices (not shown on the drawing) for preventing the gas under pressure within the melting chamber from leaking out around the electrodes.

The shaft, as previously mentioned, is supported by an iron plate, resting on six cast iron pillars arranged symmetrically around the furnace hearth. To prevent the pillars from being cut off in the event of the molten iron accidentally finding its way to them, the lower parts are protected by sand inclosed in a sheet iron casing. This mode of construction enables the operator to repair or replace, without removing the shaft, those parts of the furnace needing the most frequent repairs, viz., the lower part of the shaft and the melting chamber.

In order to collect the waste gases at the throat of the furnace—with the object of utilizing them economically for the purposes specified above, and at the same time to protect the charcoal fuel from premature combustion—the top of the shaft is closed by an iron cover, fitted with a charging bell and hopper, covered in by means of a specially constructed sheet iron hood, designed to prevent gas explosions caused by the intrusion of atmospheric air into the shaft when a charge is being introduced.

The collected gases at the throat of the furnace are discharged into a down-comer pipe, provided with a dust catcher, from which the gases, largely denuded of dust, are drawn by means of a fan and forced down into the melting chamber through the three tuyeres. With a view of preventing excessive pressure in the interior of the furnace, an uptake pipe, provided with loaded, self-closing valve, is placed at the junction of outlet pipe and top of down-comer for conducting the gases generated in the furnace (when the pressure reaches a certain point) to apparatus designed for the utilization of the waste gases or to the atmosphere.

Raw Materials Used.

The iron ore placed at the disposal of the inventors for the trial run was magnetite from Grängesberg, and had the following composition:

	Per cent.		Per cent.
Fe_3O_4	66.46	Al_2O_3	1.07
Fe_2O_3	21.21	SiO_2	3.16
MnO	0.30	P_2O_5	2.34
MgO	0.98	S	Undetermined
CaO	3.84	Metallic iron	62.96

During the first part of the trial run coke containing 85 per cent. carbon and 0.55 per cent. sulphur was used. This, however, had been exposed for a long time to the open air and rain, which made its percentage of moisture unusually high. Lime was used as a flux. The raw material, crushed to pieces of about 1 in. diameter, was conveyed to the charging floor of the furnace, where it was weighed and charged by hand. The instruments were read every half hour, the product of each tapping carefully weighed, and samples of both the iron and slag taken for analysis. The iron and slag were tapped through the same hole, but no difficulty was encountered in separating the iron from the slag after cooling.

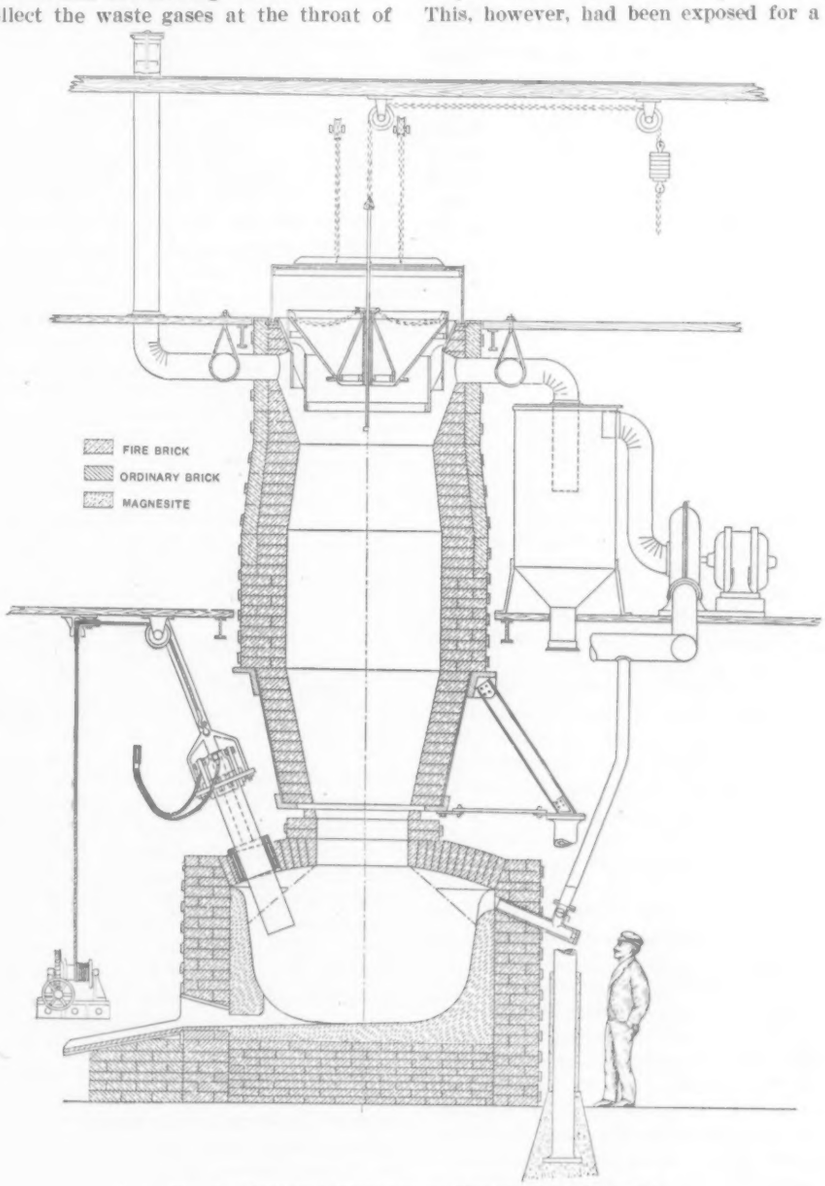


Fig. 2.—Sectional Elevation of Electric Shaft Furnace.

The men operating the furnace were divided into two shifts, each shift being of 12 hr. duration and consisting of four laborers and a foreman.

Thermal Conditions and Recording Apparatus.

Notwithstanding the fact that the furnace was new in every respect, only one week was allowed for heating

from the time the first coke fire was lighted in the melting chamber to the time of the first tapping. Experience with blast furnaces has proved that at least three weeks should be devoted to the drying of the linings in furnaces of this size prior to charging, otherwise the heat energy which should be utilized in the reduction and dissociation of the ores will be expended in converting the moisture in the brickwork into steam, resulting in the chilling of the iron and consequent reduction of the output. The unavoidable neglect of this precaution in the present instance interfered materially with the normal thermal working condition of the furnace throughout the entire trial, especially at the beginning.

Although the furnace was designed for a much larger capacity, the power available at this time was only 400 to 450 kw. The tension was kept at between 40 and 50 volts and the power factor, which with the lower tension during the first part of the run was 0.85, rose to 0.90 with the higher tension.

A point in the construction of this furnace deserving of special mention is the almost complete absence of fluctuation in the instruments for recording the current and tension delivered. This in former electric furnaces occasioned a serious difficulty and necessitated either the

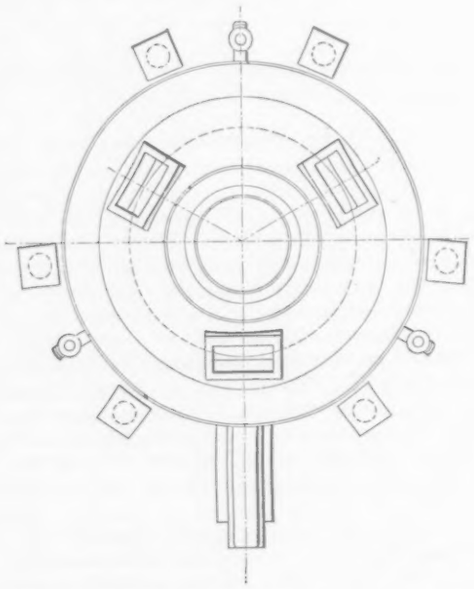


Fig. 3.—Plan View of Furnace with Shaft and Electrodes Removed.

installation of automatic electrode regulators or the constant presence of a man at the switchboard for adjustment and regulation. In this case, however, the only regulation required is that corresponding to the consumption of the electrodes, which requires to be done once a day and sometimes for slightly longer periods. The cost of the electric installation for this furnace compared with that of other types is, therefore, cheaper, inasmuch as the costly apparatus for controlling the electrodes is dispensed with. Since the fluctuation of power is almost negligible and current shocks do not have to be taken into consideration, this type of electric furnace constitutes an ideal load for a power station.

Charges on the Trial Run.

The trial run was started at 6.30 a.m. December 27, when the readings of the different measuring instruments were taken and recorded every half hour. Samples of the pig iron and slag were taken for analysis, and the iron, after the slag had been entirely removed, was carefully weighed. During the first part of the trial the composition of the charge was:

	Pounds.		Pounds.
Ore	209.0	Lime	11.0
Coke	48.4		

The coke used in this charge corresponds to a consumption of about 810 lb. per gross ton of pig iron. During tapping, however, carbon was observed to escape through the tap hole with the slag, which, in addition, contained a considerable amount of carbide. This indicated an excess of carbon. The charge was, therefore, altered the next morning to the following composition:

	Pounds.		Pounds.
Ore	209.0	Lime	4.4
Coke	42.0		

corresponding to a consumption of carbon of about 704 lb. per gross ton of pig iron. On the evening of the same day the charge was again changed to:

	Pounds.		Pounds.
Ore	220.0	Lime	4.4
Coke	41.8		

which corresponds to a consumption of carbon of about 671 lb. per gross ton of pig iron. The coke used up to this time was very wet, having been exposed to rain and snow. As, however, dry coke, which consequently contained a higher percentage of carbon per unit weight, was now available, the charge was again changed to:

	Pounds.		Pounds.
Ore	220.0	Lime	4.4
Coke	37.4		

which corresponds to a consumption of coke of about 605 lb. per ton of pig iron. This might be further reduced when the furnace is working normally and the gases circulated as previously described. However, this consumption of carbon must be considered as extremely satisfactory.

Pig Iron Analyses and Output.

Analyses of the pig iron from six different tappings and of the slag from tapping No. 4 are given below. From an inspection of these analyses it will be seen that the sulphur content, especially in the last one, is exceedingly low. During the last tapping the temperature of the furnace was higher than in the former tappings, which accounts for the low sulphur content.

Analyses of Pig Iron Produced.

Cast No.	C	Si	Mn	P	S
2	3.20	0.056	0.32	1.80	0.015
3	3.20	0.103	0.37	1.50	*
4	3.40	0.065	0.34	1.64	0.015
5	3.20	0.075	0.32	1.80	*
9	3.20	0.075	0.39	1.90	0.015
13	3.15	0.070	0.24	2.06	0.005

* Undetermined.

Analysis of Slag from Cast No. 4.

SiO_2	26.54	S	0.78
CaO	54.48	Fe	0.35

[A table follows, in which are given the half hourly readings of the volts and amperes and the consumption of energy throughout the 50 hr. of the test. In the latter part of the test, when the electric efficiency was highest, the amperage ranged from 7200 to 7800, the tension averaged 38 to 39 volts, and the power employed was between 380 and 400 kw. The record of the casts shows 2860 lb. of pig iron at 9.30 a.m. December 27, 1067 lb. at 2 p.m. and 1441 lb. at 8.30 p.m.; 1650 lb. at 2 a.m. December 28, 1870 lb. at 8 a.m., 1430 lb. at 5.30 p.m. and 2343 lb. at 11 p.m.; 1562 lb. at 5 a.m. December 29.—ED.]

The output continued to rise steadily, as the furnace more nearly approached its normal working condition—even with the inadequate power supplied—until an unfortunate accident occurred to one of the water cooled stuffing boxes, necessitating the removal of one electrode. Toward the end of the run, one of the cast iron, water cooled stuffing boxes developed a bad crack, which allowed large quantities of water to escape into the furnace. This would not have occurred had sufficient time been allowed for the thorough testing of all the castings, and cannot happen in the future since the design of these water cooled stuffing boxes has been changed. But even while running with only two electrodes, the output again began to rise, when the heat lost by the water escaping into the furnace was partly restored to the walls of the furnace and to the wet charge in the shaft.

The time limit set by the director of the company for the delivery of power to the furnace was January 1, 1909; it was necessary, therefore, that the latest charge in the furnace should be all melted down and tapped out prior to that date. This was accordingly anticipated, and the official trial run was discontinued at 6 a.m. December 29, 1908.

Rate of Pig Iron Production.

In the following table is given the number of tons of pig iron produced per electrical horsepower year, in casts Nos. 2 to 10, inclusive:

Cast No.	Tons of pig iron per E.H.P. year.	Cast No.	Tons of pig iron per E.H.P. year.
2	0.744	7	*1.120
3	1.870	8	3.160
4	2.180	9	1.950
5	2.360	10	1.030
6	2.440		

* Electrode holder began to leak badly.

From the foregoing table it will be seen that the output before the leakage of water into the furnace became serious, was 2.44 metric tons per electrical horsepower year. This figure—considering the disadvantages † under which the trial run was made—may be deemed very satisfactory. Owing to the short duration of the trial, it was impossible to determine the consumption of electrodes per ton of pig iron produced. According to former tests, however, this may be placed at about 5 kg. per metric ton (2204 lb.) of pig iron produced.

Technical Objective of Trial Run.

The trial run was intended to elucidate the following points:

1. Whether undisturbed and uniform working without troublesome regulation of the electrodes could be obtained.

2. Whether great variations in the consumption of energy would occur.

3. Whether the free spaces within the melting chamber would be maintained with a shaft considerably higher than in the furnaces of earlier design and construction.

4. Whether the contraction of the shaft would prevent the charge from sinking uniformly, or cause hanging.

5. The durability of the arched roof and the possibility of cooling it by means of the circulating gas.

Deductions from Observations.

The following is a summarized statement of practical deductions drawn from observations made during the trial run, having regard to the objective points specified above:

1. It was observed that the furnace operated uniformly and without trouble of any kind, and that the electrodes required absolutely no regulation, in one case, for five consecutive days. In any case, the only regulation required is that corresponding to the consumption of the electrodes, and is necessary only once a day, and sometimes not for much longer periods. On account of this, expensive regulation can be dispensed with.

2. During the short trial, even though the furnace did not approach its normal working condition until toward the end, it was observed that the consumption of energy was remarkably uniform. This can readily be seen from an inspection of the readings of the different instruments.

3. Free spaces were maintained between the linings of the roof and walls and the electrodes and charge at the openings where the electrodes enter the melting chamber.

4. It was found that the charge did not jam in the lower contracted neck of the shaft, as had been feared, but moved with regularity into the melting chamber.

5. Although the gases generated by the reduction of the ore were not circulated through the cooling tuyeres until near the end of the trial run, it was demonstrated that the lining of the roof of the melting chamber was effectively cooled by this means.

The Electric Furnace and the Charcoal Blast Furnace.

Accompanying Dr. Haanel's report is an estimate by Prof. Von Odelstierna, Stockholm, Sweden, of the cost of pig iron from a charcoal blast furnace compared with that of pig iron from an electric shaft furnace. The ore used is assumed to contain 60 per cent. metallic iron and the charcoal 83 per cent. carbon. It is pointed out that the gases produced in the electric shaft furnace contain probably 60 per cent. more CO than the ordinary blast furnace gases. Labor charges and general expense are assumed to be the same. A charcoal blast furnace of medium capacity produces in Sweden about 8000 to 10,000 net tons of pig iron a year—a quantity which the writer believes can be produced in a properly constructed electric shaft furnace. The items in the comparative statement are as follows:

Charcoal Blast Furnace.

Charcoal, 0.95 ton at $8 per ton	$7.60
Labor	1.00
Repairs and general expense	1.50
Total	$10.10

Electric Shaft Furnace.

0.27 ton charcoal	$2.16
0.3 E.H.P. year at $12	3.60
Labor	1.00
10 lb. electrodes, at 3 cents per pound	0.30
Repairs and general expense	1.50
Total	$8.56

Professor Von Odelstierna adds: "In this calculation the price of ore and limestone and the royalty are not given, as the former varies with the locality and the character of the ore, and the latter has not yet been determined. From this calculation it is apparent that in Sweden, under the above mentioned circumstances, a saving of $1.55 should be effected in the production of pig iron by the electro-thermic process."

An Electric Steel Furnace.

The report also contains a description of an electric steel furnace for melting and refining, designed by the inventors of the electric shaft furnace employed in the runs described by Dr. Haanel. Either a two-phase or three-phase current can be used with this furnace, which has but two adjustable electrodes, the bottom of the hearth, composed of magnesite, intermixed with a small amount of graphite, forming the third. By a special distribution of the electrodes the bath is caused to rotate in a vertical plane, thus continually bringing new material in contact with the slag for purification. The time required for refining is thus considerably shortened. The patent specification of the new furnace is given, from which it appears that the special feature of the invention is that it permits the use of multi-phase currents without increasing the number of adjustable electrodes beyond that employed in furnaces for single-phase currents. The value of this method appears from the facts that the majority of plants are designed for multi-phase currents, and multi-phase generators are cheaper to construct than single-phase generators.

Progress of Electric Smelting in Norway and Sweden.

After devoting 10 pages of his pamphlet to a description of the manufacture of electrodes and of modern methods for manufacturing charcoal, Dr. Haanel gives two letters telling of the progress made in Scandinavia with electric smelting of iron ore. The first is from Otto Stalhane, one of the inventors of the electric shaft furnace used at Domnarfvet, saying that a contract had been made to build an electric smelting plant in Norway the past summer. The first installation includes two shaft furnaces of 2500 hp. each and two steel furnaces of 600 hp. each. All the furnaces will be supplied with two-phase current.

The second letter is from Sir Cecil Spring-Rice, British Ambassador at Stockholm, Sweden, and reached the Dominion Department of Mines June 30, 1909. It is as follows:

Arrangements have been made with the Trollhatten Water Power Company for the construction and working of three electric furnaces for the production of pig iron. Each furnace is to receive a current of 2500 hp. and to produce 7500 tons per furnace per annum. Two are to be in working, while the third is in reserve. The price of the current per horsepower per annum is 27.60 kronors ($7.45) for the first ten years and 36.80 kronors ($9.93) the next ten. The ore is to be brought from Grängesberg, containing from 0.4 to 1.9 per cent. phosphorus. Westphalia coke will be used, costing about 21 kronors ($5.67) at Trollhatten. It is calculated that the cost of produc-

† Water leaked into the furnace in small quantities from the beginning of the trial, but was not so noticeable until after the seventh cast.

tion will be 51 kronors ($13.77) per ton pig iron. The sale price is 58 kronors ($15.66). With a production of 15,000 tons per year the cost is calculated as follows:

	Kronors.	$
Three furnaces	150,000	40,500
Tools, &c	15,000	4,050
Crushing apparatus for 35,000 tons ore and 7000 tons coke	9,000	2,430
Electric motors, lighting, &c	6,000	1,620
Transport of ore and coke from harbor	15,000	4,050
Transport of pig iron and slag	12,000	3,240
Houses and shelters	64,000	17,280
Harbor works, leveling, &c	15,000	4,050
Laboratory, unforeseen, &c (11 per cent.)	20,000	5,400
License	34,000	9,180
Working capital	25,000	6,750
Minimum capital	235,000	63,450
Totals	600,000	$162,000

Chili Iron Making Prospects.

At a recent meeting of the Mining Institute of Scotland Archibald Russell read a paper on "The Coalfields and Collieries of Chili" in which he touched on the iron deposits. He pointed out that the large percentage of phosphorus and sulphur in the most accessible ores, combined with the fact that the coal available is also impure, accounts for the fact that up to the present iron has not been produced on a commercial scale in Chili. He continued as follows:

The first person to appreciate the possibilities and economic value of the production of pig iron in Chili was Don Matias Cousino, who, at the time of his death, had in view the establishment of works in the south. Since that time various persons have taken up the question, the government having also procured expert advice on the subject. Nothing practical, however, was done until a few years ago, when a French syndicate (in which the Creusot Company is largely interested) obtained a concession to erect blast furnaces and other metallurgical machinery at Corval, near Valdivia. The government granted the syndicate a large area of valuable land covered with forests, and under certain conditions guaranteed the interest on the money expended on the plant. The intention is to bring the iron ores and limestone from the north in large steamers (which would carry return loads of timber and agricultural products), and smelt these with charcoal in large furnaces, thus producing pig iron of very superior quality. This would be converted into steel and rolled into rails, bars and plates, while the by-products would be obtained from the carbonization of the wood fuel.

At present there are under construction four blast furnaces, 96 ft. high, each capable of producing 50 tons of pig iron per 24 hours, with six Cowper stoves, while a plant for the manufacture of wrought iron and steel is also being erected. Aerial tramways have been built to connect the forests with the blast furnaces, and a rail 2950 ft. long has been built from a pier, where the mineral will be discharged. For power purposes six large Meyer boilers, electrical plant of 675 hp., and a complete air compressing plant have been erected.

The annual consumption of iron and steel in Chili at present is about 100,000 tons, while the neighboring republic of Argentina consumes about 700,000 tons annually, and it is hoped that the Corval plant will obtain a large proportion of the trade, especially in steel rails. It is very doubtful, however, whether it will be able to compete with foreign rails in Argentina, and, seeing that freights by sailing vessels to Chili are so cheap, on account of return cargoes of nitrate always being available, unless a very heavy duty is put upon imported material, the cost of production will be too high to make the business a commercial success.

Exports of domestic foodstuffs, cotton and mineral oils from the United States last month totaled less than in any month since 1904, their value being $36,120,000. This was a very small decline from July, but it made August the low record month in the agricultural export trade since the summer of 1904.

The Hydraulagraph.

An Instrument for Recording the Hydraulic Pressure Exerted Throughout the Driving of a Forced Fit.

A new product of the American Steam Gauge & Valve Mfg. Company, Boston, Mass., which is attracting the attention of railroad mechanical men is the hydraulagraph, an instrument for recording the pressure exerted by a hydraulic wheel press at every stage in the ram movement when forcing a wheel on an axle. If the bore of the wheel and the surface of the axle in the fit are true and properly proportioned the pressure required of the press when driving the axle home should increase in an approximately constant ratio from the time when

Fig. 1.—Exterior of the Hydraulagraph, Made by the American Steam Gauge & Valve Mfg. Company, Boston, Mass.

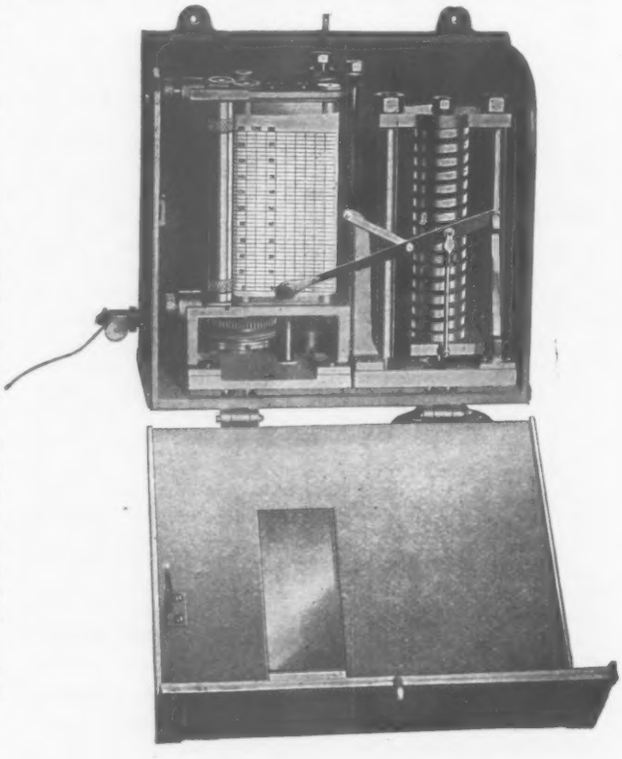


Fig. 2.—Interior of the Hydraulagraph.

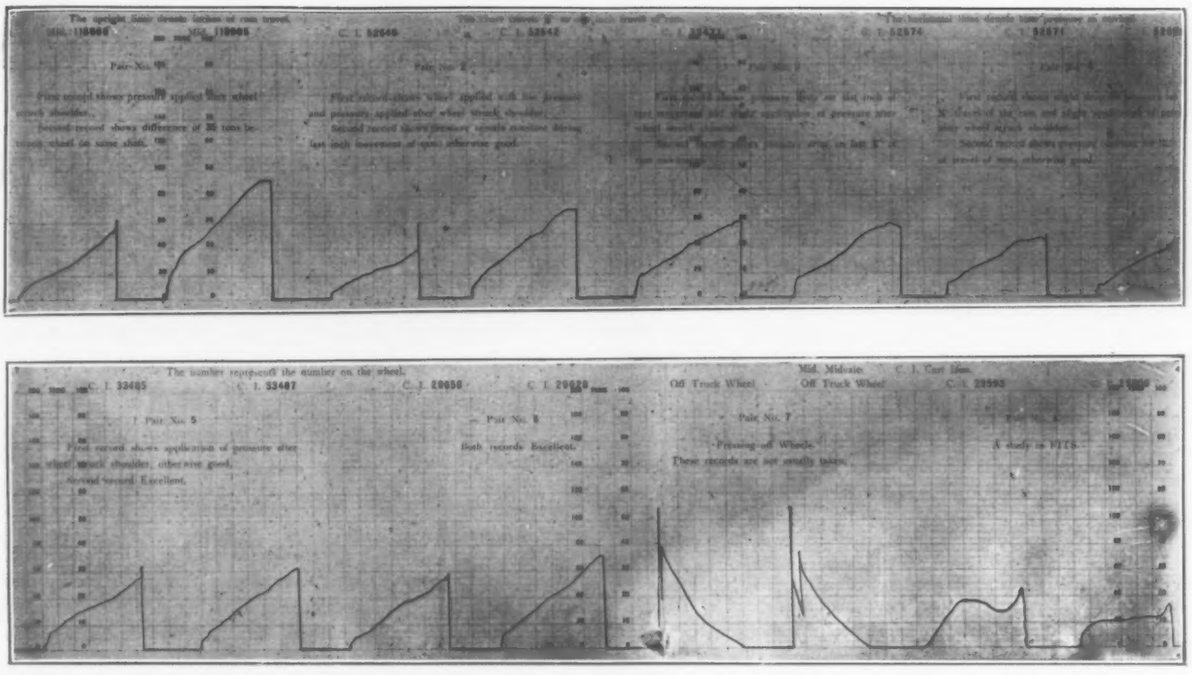


Fig. 3.—Sections of Typical Hydraulagraph Diagrams Showing How to Analyze a Wheel Fit. (About ⅝ Full Size.)

the axle is first entered in the bore of the wheel until the wheel encounters the shoulder on the axle. The specified maximum pressure should be reached before the wheel is against the shoulder, as after that additional pressure has no effect in increasing the strength of the union of the two parts. In other words, the holding power to resist twisting of the axle in the wheel is a function of the pressure exerted at or just before the instant when the wheel reaches the shoulder of the axle. Obviously it is possible to run the pressure up after that time, and an inspector or foreman might be deceived intentionally or accidentally by the reading of a pressure gauge after the driving was finished and before the ram of the press was retracted. With the new instrument, a continuous recording pressure gauge, a diagram is obtained which is comparable to that of a steam engine indicator. It traces a line the ordinates of which are proportional to the pressure and the abscissae to the stroke of the ram, or what is the same thing, the longitudinal movement of the axle with respect to the wheel. Such a record gives an exact graphic attest to the condition under which the fit was made and is impossible of wilful or accidental misinterpretation. If the fit of either wheel is shown to be unreliable that pair can be rejected at once, where otherwise it might be placed in service and become the cause of a serious accident.

In the rolling stock equipment of steam or electric railroads there is probably no part on which safety so much depends as on the strength and reliability of the trucks. In the trucks themselves one of the things which has been most uncertain was the degree or security with which the wheels were held to the axles. Formerly there was no record to show what that was in the original assembling of the parts, nor were there means of detecting an insecure wheel by inspection until it became so loose as to perceptibly move on the axle, and by that time it would be dangerously near the point of doing damage. The hydraulagraph is believed to be the first instrument which has placed an exact knowledge of the wheel security in the hands of the engineer, and with the usual tests to determine the safety of other parts of the truck make it possible now to turn out a completed truck with a very fair measure of dependability.

The manufacturer has heretofore furnished for similar purposes a maximum pressure recording gauge which simply showed the highest pressure which was reached during the driving of a fit, but that was not enough of a check on the reliability of the work, because it was possible for the operator, knowing that a maximum pressure was demanded, to get the prescribed reading on the diagram of the gauge by simply continuing the pressure after the wheel had reached the shoulder, when in fact the wheel might have been so loose that it was a menace to safety from the moment it was put on.

In the hydraulagraph a spring of great power of resistance and unerring accuracy is used, and by means of an air chamber to take up the vibration which naturally must follow the tremendous pressure of a wheel press running up into 200 tons a diagram is obtained with as clear a line as that of the American-Thompson improved indicator card. The moment the operator attempts to get the required maximum pressure on a loose fit the diagram shows a vertical line. There is no way of disguising this, neither can the operator by any means obtain access to the diagram or pen. Any effort on his part to hold the pen by thrusting something into the instrument would only break it and expose him. The only portion of the diagram accessible to the operator is the marginal space left for him to record the wheel data, which is a necessary part of his work and one of the most valuable records to the safeguarding of the public.

Fig. 1 shows the exterior appearance of the hydraulagraph, Fig. 2 shows the instrument with the case open exposing the interior and Fig. 3 reproduces portions of a chart showing typical records. The whole chart is 100 ft. long; each ¼ in. represents a 1-in. movement of the ram. A roll can easily record 400 complete movements, or the records of 200 pairs of wheels. By the notes which are given in Fig. 3 over each diagram may be seen which are records of good and bad wheel fits and how easy it is to tell when a proper wheel fit has been made. The records shown were made in actual shop use and are the best evidence of the value of such an apparatus to the railroad and car truck manufacturing industries.

The sheet and tin plate mills of the new Aliquippa Works of the Jones & Laughlin Steel Company, on the Ohio River below Pittsburgh, will be served with power to operate a number of direct current motors, through a rotary converter, from a 500-kw., 6600-volt, three-phase 25-cycle Westinghouse turbo-alternator. The fuel used in the boiler plant will be coke oven gas, and the turbine will operate on a steam pressure of 150 lb., exhausting into a vacuum of 28 in.

Hutton H. Haley has succeeded to the entire business of the O. V. Dodge, Jr., Company, handling iron and steel and railroad supplies, Dwight Building, Kansas City, Mo. The business will remain intact under his name with the same accounts as previously represented by the company above named.

Rail Rolling Methods.

Solidifying Steel Ingots by Present Blooming Mill Action Impracticable.

BY JAMES E. YORK.

The absolute necessity of having a solid ingot, when steel of a uniform physical structure is to be produced, is self-evident. All theoretical and practical steel makers agree in this. There are several processes that are known to the trade that claim to solidify ingots, but these methods are confined to compressing the metal before the ingot is removed from the mold, and are for that and other reasons both slow and expensive. Thus they would seriously interfere with the output of modern rolling mills, and, in consequence, these methods have not been applied to rail ingots.

Steel rails are subjected to more shocks and stresses than any other form of steel of similar grade, and the necessity for some simple, quick and efficient way of producing a rail of uniform physical structure without resorting to the wasteful and unreliable method of discarding a large part of the ingot will be appreciated by practical steel makers and others interested. The blooming mill is the most efficient method of reducing steel ingots, but as a means of thoroughly solidifying the metal it is a comparative failure, as I shall attempt to show.

In a paper entitled "A Reliable Steel Rail and How to Make It," read by me in New Haven at a recent meeting of the American Institute of Mining Engineers, I have given general reasons from my own practical experience why the ordinary blooming mill will not efficiently accomplish this solidifying. I will now briefly give specific reasons why a steel ingot cannot be solidified during the rolling in the blooming mill, and therefore it must be done by ingot compression before rolling, for, unless it is done at this stage of operation, it cannot be done at all, as the temperature becomes too low to allow of its being done successfully at any subsequent stage of operation.

The Ordinary Method of Rolling Leaves a Pipe Still Open.

Fig. 1 shows a rail ingot in horizontal position for rolling in a blooming mill. The ingot is represented with a "pipe" in one end. It must be understood that the blooming mill can only reduce two sides of a square ingot at one operation. This action results in only changing the shape of the pipe, as shown in Fig. 2. The pipe becomes smaller more from lengthening the ingot by reduction than from the effective penetrating of the mass by rolling action. But admitting, for argument's sake, that the pipe is gradually flattened by rolling, this condition would be immediately nullified by the rolling action of reducing the other two sides, when the pipe is opened again in squaring the bloom, as shown in Fig. 3.

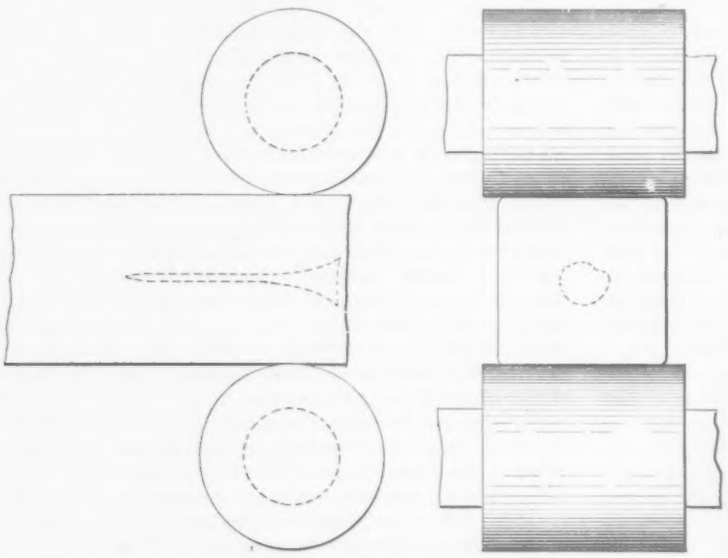


Fig. 1.—A Rail Ingot in Horizontal Position for Rolling in a Blooming Mill, Showing the Pipe in the End of the Ingot.

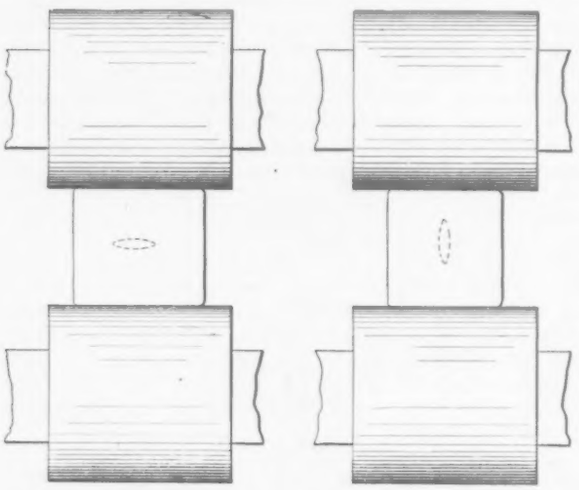


Fig. 2.—The Shape of the Pipe in the Ingot After One Rolling.

Fig. 3.—The Shape of the Pipe in the Ingot After the Latter Has Been Squared in the Next Operation of Rolling.

It is well known that the area and lengths of pipes vary according to the chemical composition and the temperature of the steel when poured into the molds, also the speed at which the molds are filled. These and other causes have an influence on the size and length of the cavity; consequently a uniform discard is unreliable, and unless the pipe is totally eliminated by the discard it cannot be solidified by subsequent rolling. The lips of the pipe will be flattened, but no welding can occur. By the time the ingot is reduced to a billet the temperature would be too low for welding purposes.

Results in Rolling Slabs Cannot Be Duplicated in Rolling Square Ingots.

Prof. H. M. Howe presented a paper entitled "Mechanical Treatment of Steel," at the meeting of the American Society for Testing Materials, held in Atlantic City from June 29 to July 3, 1909. In this paper he describes the rolling of a prepared slab, made from a square ingot, into a plate. The object of the rolling was to show that gases contained in blowholes could be eliminated and the metal made solid. The results obtained in rolling a slab cannot be duplicated in rolling a square ingot, for the following reasons:

1. In rolling a slab into a plate the entire rolling pressure is applied on two sides and the metal is not turned 90 degrees during the rolling, as in a square ingot, the pressure being all in one direction. The method of thus rolling a slab is shown in Fig. 4.

2. The plate produced was ½ in. in thickness, and was finished at a much lower temperature than that at which rails or billets are finished.

3. The thickness of this plate is about one-third of that of the head of a rail, and the amount of solidification of the metal accomplished is in inverse proportion to the thickness of the metal, because the thinner the metal the lower the heat and low temperature always makes possible the production of comparatively solid steel.

During the discussion of Professor Howe's paper, as

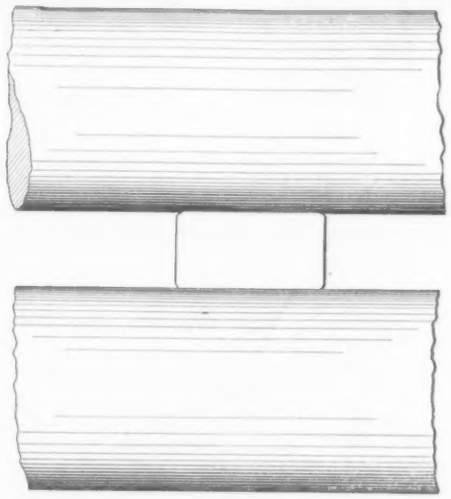


Fig. 4.—The Rolling Pressure as Applied to a Slab in Rolling it Into a Plate.

given in *The Iron Age* of July 8, it was brought out that the closing of blowholes is the very purpose of certain mill operations—namely, the heating of the steel to a high temperature and the heavy first drafts in the rolls. It is possible to close blowholes located near the surface by this method, but deep seated blowholes or pipes would not be closed by the first heavy drafts in the rolls, and the high temperature referred to seriously deteriorates the quality of the steel produced.

Rolling a Billet Into a Rail.

The action of rolling a billet into a rail in the shaping or roughing rolls is different in its effect on pipes from the action of the blooming mill. The shaping of a billet when rolling to the rail section results in fixing the pipe in a certain position in the rail, as shown in Fig. 5. The location of the pipe in the finished rail will vary, according to its size, shape and location in the ingot. It will generally develop in the head on account of the head's larger mass, Fig. 6, and when located in the head it re-

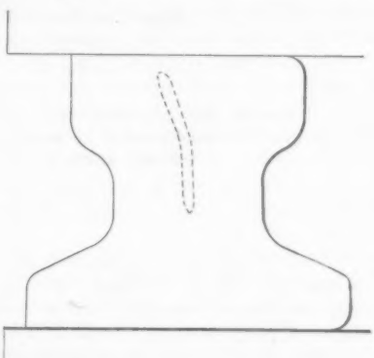


Fig. 5.—How the Shaping of a Billet When Rolling it to a Rail Section Fixes the Pipe in a Certain Position in the Rail.

sults in split heads or ball fracture, as shown in Fig. 7; as the pressure, when in service in the tracks, is transmitted by axle loads to the head, the certain tendency is to open the lips of the pipe, which in every case are almost in a line with the pressure applied by the rolling stock.

The tendency of the rail to fracture, malformation or flattening from pipe structure is increased by the presence of segregated matter in the head. Under these conditions the head of the rail is the weakest part. Pipe structure extends also to the web and flange, but in that case as a rule is not so weakening to the rail as when it is partially or entirely located in the head. The size and shape of the pipe in the ingot regulate the size and location of it in the rail. Blow holes when present also depreciate to a degree the physical qualities of the rail, so that it can be stated as a fact that until the ingot is made solid in the center before rolling, reliable rails cannot be manufactured from the top of the ingot.

Why the Solidification of Ingots by Present Methods is Impractical from an Economic Standpoint.

1. The pressure is in every case applied over the entire column structure of the ingot, and by the time the process is applied the shell of the ingot has solidified from freezing and resists enormously any reduction of area by compression. It is impossible to act successfully on the ingot before this freezing of the shell of the ingot takes place by any of the existing methods.*

2. The exterior of the ingot gets the necessary compression during rolling, but the pipe located in the center gets no effective solidification because the rolling stretches the pipe longer without closing it, and in consequence it becomes absolutely necessary that metal be displaced from the side of the ingot to fill the pipe.

The York Method of Preliminary Transverse Rolling.

The displacing of metal from the side of the ingot to close and solidify the center is exceedingly simple and requires little power, comparatively, and does not interfere in any degree with the subsequent operation of roll-

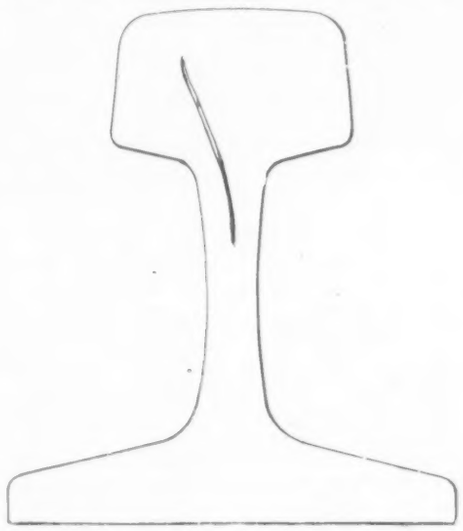


Fig. 6.—The Development of the Pipe in the Head of the Rail.

ing. The York method of accomplishing this by transverse rolling or other means for displacing the metal from the side of the ingot to solidify the center is a simple, cheap, quick and effective process by which the solidification of ingots can be accomplished. This method is illustrated in Fig. 8, which shows a section of a mill built for the purpose of rolling ingots transversely, as a preliminary operation to passing them through the blooming mill.

This process is simple and would not interfere to any

* See *Cassier's Magazine*, January, 1909, for a description of these methods for closing pipes in ingots.

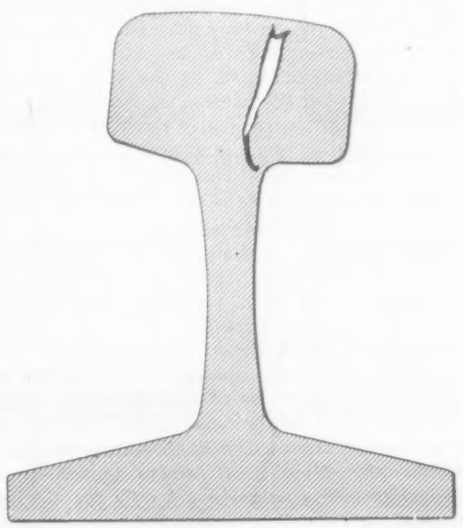


Fig. 7.—The Pipe in the Head Results in a Split Head or Ball Fracture.

extent with the present output of modern rail mills, but would tend to increase it, since the rolls are short and permit heavy reductions without springing; and the cost per ton is low, being less than one-third of any other known method. The operation is conducted as follows:

1. The ingots for quite a number can be treated at one time, six being shown in the illustration, are laid horizontally on a table that moves laterally under the rolls at the same surface speed. The ingots are placed slightly obliquely to the face of the rolls, which by gradually presenting the side of the ingot to the action of the rolls, prevents any shock to the mill.

2. There is no material lengthening of the ingot by this method, which is in direct contrast to the action of the ordinary mills, but all the compression is applied to solidify the metal. The first compression raises the segregated matter, if still fluid, which is accomplished by a projection on roll A, that compresses the ingot across the section, in the place where the fluid matter is situated. After this has been done the compression is applied over the entire face of the ingot in order to close and weld any surface blowholes that are present, and by so doing prevent in a large degree the producing of No. 2 rails. Surface blowholes I regard as the chief cause of these inferior rails.

3. The final operation is directed to welding and solidifying the pipe (or pipes) and deep seated blowholes. This is accomplished by applying the compression in a direct line with the axis of the ingot by a rib roll, B, which is synchronized with the table, so that the pressure is applied at the same place until the ingot is solid. This operation forces the metal from the side into any existing pipes in the interior. The ingots during the operation are so held that there is no material yielding of the metal in any direction except on the side that the roll is compressing and on the under side which is pressing upward in a direct line with the rib roll.

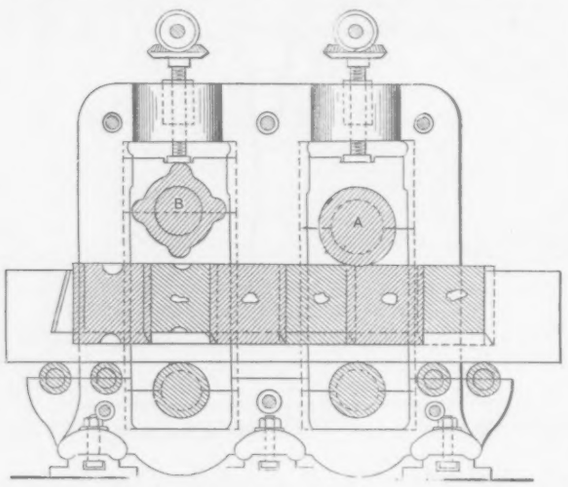


Fig. 8.—The York Method of Preliminary Transverse Rolling, Showing Six Ingots Passing Through the Rolls.

4. The solidifying of ingots by the York method prevents the possibility of the ingot being liquid in the center after treatment, and consequently removes the necessity (and uncertainty) of the ingot becoming solid during heating in the soaking pit. This solidity is now insisted on by present specifications for rail manufacture.

Chrome Iron Ore in Canada.—A report on "the chrome iron ore deposits of the Eastern Townships, Province of Quebec" has been published recently by the Mines Branch of the Department of Mines of Canada. It is prepared by Fritz Cirkel, long connected as consulting engineer with the chromite and asbestos industries. The deposits of these two substances in the Province of Quebec occur in the same region, and the origin of both is closely connected with the serpentine rocks of the eastern townships. The present pamphlet, which contains 141 pages, is valuable not only for the data it gives concerning Canadian chromite deposits but for its chapters on the uses, the technology and the metallurgy of chromium and its descriptions of the various deposits in all parts of the world. The statistics given indicate that the total value of the Canadian exports of chromite since 1886 have been $683,716. The production in 1908 amounted to 7225 net tons, valued at $82,008.

A Gröndal Plant at New Norwegian Iron Mines.

In northern Norway, nearly 300 miles north of the Arctic Circle, an iron ore field is now being developed which promises to take an important place in the European iron industry. It is the Sydvaranger group of mines located near the Russian line, and accessible only by steamer around the North Cape. The ore is a low grade magnetite, containing an average of only 34 per cent. of iron. It is, therefore, eminently a concentrating proposition. The company which has been formed for the exploitation of this field and which comprises mostly German and Swedish interests, after thoroughly investigating the various concentrating processes, has adopted the Gröndal wet process with the briquetting of the fine concentrates.

The ore resources at Sydvaranger are very large. It is calculated that above sea level about 450,000,000 tons are available. It is proposed to quarry this in open cut to the extent of 1,200,000 tons yearly at the beginning of operations and gradually raise this tonnage. The ore will be loaded by steam shovels and transported to giant gyratory crushers—the No. 18 size of the Allis-Chalmers Company—located at the mines. The broken ore, in pieces of from 4 to 5 in. size, will be transported in standard gauge cars to the concentrating plant, which is located on the water a few miles from the mines. The concentrators are being built in 12 parallel units, each preceded by a crude ore bin, which delivers the ore by means of an automatic feeder to a jaw crusher. The crushed ore, now 1 to 1½ in. in size, is carried from the crushing house on conveyor belts to the distributing bins of the concentrating plant proper. Each unit of this plant consists of two Gröndal ball mills, two tandem separator, two Gröndal tube mills and two finishing tandem separators. The grinding and separating capacity of each unit will be 300 tons per 24 hr., or about 3600 tons for the whole plant, from which about 1500 tons of concentrates will be obtained daily. To begin with, only one-third of this will be briquetted; the rest will be shipped in the form of fine concentrates. By the repeated grinding and concentrating procedure as described, the iron content is raised to 66 to 69 per cent. The final product will, therefore, be of exceptionally high grade. The total product will be exported to German iron works.

The whole undertaking is modern in every respect, with labor saving machinery installed everywhere, from the mine to the loading docks, facilitating the handling of a great tonnage and lowering the cost of production. The central power plant furnished with steam turbines throughout is laid out for three units of 3100 hp. each, of which two are now under erection. Transmitted electric power will be used exclusively both at the mine and in the mill, in which latter place each machine will be driven by an independent motor.

The undertaking is remarkable for the fact of the very low iron content of the crude ore and the necessity, on account of its fine granulation, of fine grinding it all in ball and tube mills. The success of the Gröndal methods where they have been employed are considered by the Sydvaranger Company to assure the economical success of the enterprise.

The reference to the model Pennsylvania road which was made in *The Iron Age* of September 2 has brought out so many inquiries regarding it that it seems advisable to refer those desiring further information on the subject to Joseph Hunter, State Highway Department, Harrisburg, Pa. The road was built under the supervision of that department, while the expense was borne by the State, county and township.

The Cornwall Portable Concrete Mixer.

A new adaptation of one of the earliest types of concrete mixing machines has been brought out recently by the United States Steel Mixer Company, Atwood Building, Chicago, Ill. As shown in Figs. 1 and 2, it consists of a steel mixing cube mounted upon two steel standards, which are supported by a frame and axle carried upon two wheels 3 ft. in diameter with 4-in. tires. Power to revolve the cube is obtained from the cart wheels when in motion through two 23-in. gears with 2½-in. face attached to them. These, as may be seen in Fig. 3, engage two similar gears keyed to the trunnions of the cube, to the diagonally opposite corners of which the latter are riveted. Through the trunnions, which are hollow, a pipe is inserted and connected at one end leading to the water tank. Inside of the mixer the pipe is perforated and water for the batch is supplied by turning a small valve. To prevent drip from the supply pipe the bearings attached to the inlet side are protected

Fig. 1.—The Cornwall Portable Cube Concrete Mixer, Made by The United States Steel Mixer Company, Chicago.

by a 2-in. iron sleeve extending beyond the wheel. The tank holds 16 gal. and is fitted with a gauge glass showing the hight of the water. Thus the amount of water required for a given batch may be evenly regulated.

The gears and bearings of the machine are protected against falling grit and dirt by steel shields. When drawn by horses the cube revolves and the materials are mixed in transit. Eleven complete revolutions are made by the cube in each 102 ft. of travel and, being displaced three times in each revolution, the contents are turned 33 times in this distance. Raw materials are introduced through the door, which is securely held by a locking device in open or closed position, either with shovels or ordinary loaders. To guard against movement while loading, a pawl is provided which engages the lower gear and holds the machine steady. The driving mechanism is thrown in and out of gear by a lever within easy reach of the driver.

The mixer is made in two sizes, No. 1 designed to mix one sack of cement, or about ¼ yd., and No. 2 having

Fig. 2.—The Cornwall Mixer Open, Ready to Be Filled.

capacity for about double that amount of mixed concrete to the batch. While adapted to any kind of work requiring concrete mixture, this machine is especially advantageous in street paving work where with this method it is necessary to handle the materials but once, since they are mixed in transit and dumped in place. The weight of the machine is about 1400 lb.

A Charcoal Furnace Projected at Bay City, Mich.—Negotiations for the establishment of a charcoal blast furnace and chemical by-product plant for the manufacture of wood alcohol and other residue products at Bay City, Mich., have resulted in the purchase of 160 acres having a water front one mile in length. H. W. Garland, representing Pittsburgh and Cleveland capitalists, and Wm. F. Jennison of the Jennison Hardware Company, Bay City, Mich., are prominently identified with the new enterprise. It is stated that the erection of the plant will in all probability be begun in the spring and will represent an investment of $500,000 to $700,000. The plans further contemplate the establishment of finishing mills for the production of sheets and bars, but definite features of the project relate at present only to the pig iron and chemical plant. Arrangements have been made for a supply of wood with several timber intrests controlling practically 1,000,000 acres of timber land, and ore will be brought from the upper peninsula.

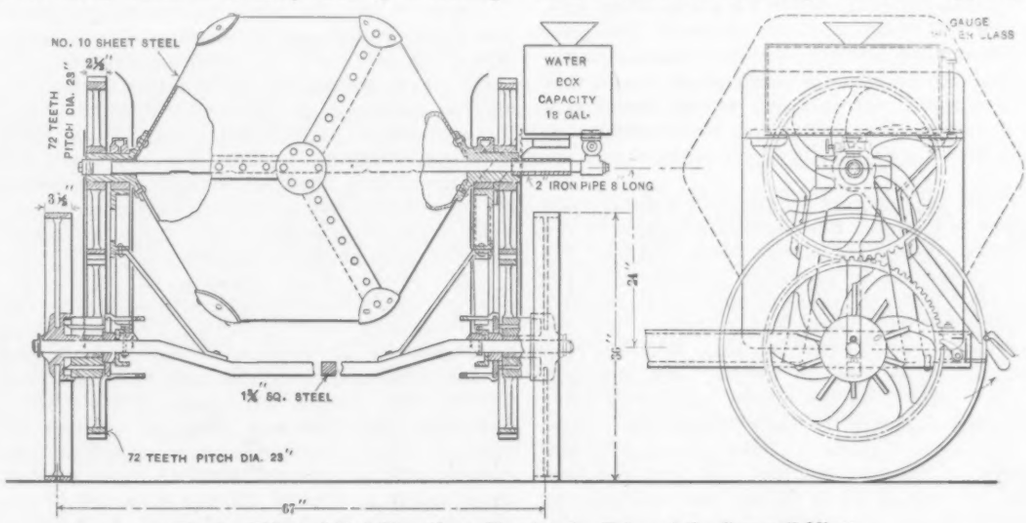


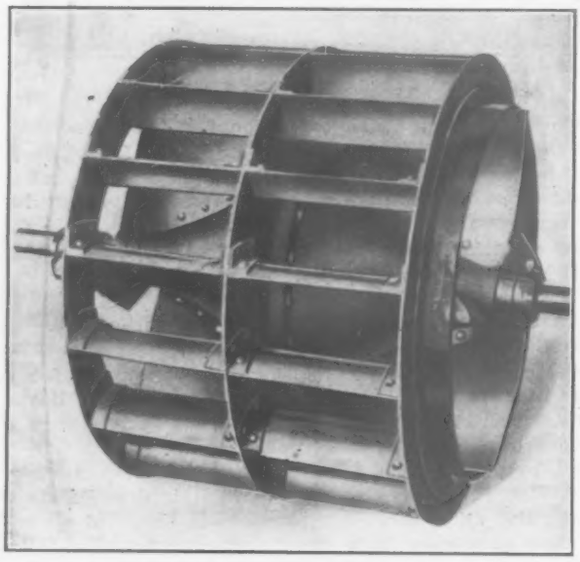
Fig. 3.—Side and End Elevations, Showing the Drive of the Cornwall Mixer.

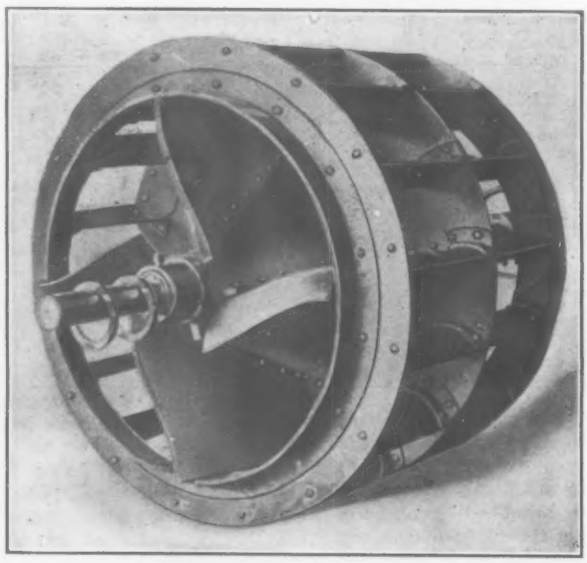
A New High Speed Turbine Fan.

Fans capable of being directly connected to steam turbines or high speed electric motors have been developed by the Conveying Machinery Company, 120 Liberty street, New York City, for which remarkable efficiency is claimed. The illustrations show two views of the rotor, which is the essential feature of the fan. The casing is not shown, as there is nothing special about it. A volute casing is generally used, but the wheels are claimed to work with equal efficiency in an open chamber. Any kind of a casing may be built around the wheel, provided, of course, with the necessary inlet and outlet. The only thing in the casing which is special is the provision of a saw-tooth cut-off, a strip having a serrated edge, which is mounted in the casing close to the rotor and has the effect of eliminating the noise made by the blades passing the edge of the outlet.

From the illustrations of the rotors it will be seen to consist of curved radial main blades having their outer edges projecting beyond the sides of the wheel, and curved forward as well as in the line of travel of the air. This not only prevents the spilling of air or gases off these blades, but also eliminates all the dead spots in the inlet as the blades gather in the air for their entire length. The main blades are attached at their base to a cone shaped hub, the surface of which is curved to gradually guide the gases to the periphery, thus securing equal density over all parts of the delivery of the wheel and preventing eddies, such as would exist in a square cornered pocket at the hub. The curved hub is made tangent to a steel plate disk to which it is securely riveted. The annular ring outside the wheel is cut from a steel plate and is in one piece. Between this plate disk and the annular ring the auxiliary blades are carried as shown. Throughout the construction is such that the wheels can run at approximately as high speeds as a motor or a turbine, the limit being the conditions of volume and pressure of the air at the periphery of the wheel.

Fans of this type operate equally well whether used as exhausters or blowers. The rigid construction of the wheel renders them particularly well adapted for handling hot gases, as in providing induced draft for boiler furnaces. When the fans are built for this service they are equipped with water boxes between the fan casing and the bearing, so that the shaft is cooled in a bath of water. These fans are claimed to be the most efficient made, both as to the power required to drive them and space required for their installation. They are made with either a single or double inlet and for any volume, speed or pressure required. In tests the fans have shown as high as 80 to 85 per cent. efficiency in sizes delivering as much as 50,000 cu. ft. of air per minute at a pressure equivalent to a head of 10 in. of water. At such a delivery the energy in the air would be 79.96 hp., and assuming an efficiency of 80 per cent. the power required to drive would, therefore, be about 99.95 hp. The fans may be built with wheel diameters of from 12 in. to 20 ft. Every fan is tested up to a peripheral speed of 20,000 ft. per minute, and some have been run up to as high as 25,000 ft. per minute. The intended peripheral speeds are about 16,000 ft. per minute. In a fan of 18 in. in diameter the allowable rotative speed is 3300 rev. per min., or in a 5-ft. diameter fan 1000 rev. per min., and proportionately for other sizes.





Two Views of the Rotor of the High Speed Turbine Fan Built by the Conveying Machinery Company, New York.

Dixon's Traction Belt Dressing.

After a belt has been in use some time its surface takes on a glaze. This results in losses due to slipping, always accompanied by heating, and draws the natural oils to the surface, causing them to evaporate. This condition further leads to the belts getting stiff and hard and lessens the angle of wrap (the angle between the extreme points touched and covered by the belt on the pulley). Without attention belts are almost sure to deteriorate as above described. Their efficiency is increased and their life lengthened according to the treatment they receive. To prevent the formation of surface glaze and the slipping accompanying it, it is the best practice to use a reliable belt dressing. This dressing should be of a nature that will not only offer temporary relief, but that will penetrate through the surface of the belt and replenish the natural oils. This will result in keeping the belt pliable and preserving the original efficiency.

Rosin is very frequently applied to prevent slipping, and this it will do, but at the same time it destroys the life of the belt itself. It affords a temporary cure, but greatly shortens the life of the belt—the rosin dries out the belt and makes the leather fibers brittle. The Joseph Dixon Crucible Company, Jersey City, N. J., makes a belt dressing which, it is claimed, does not supply a surface stickiness, but is absorbed by the belt, thus keeping it in its natural condition, preventing the formation of surface glaze with the attendant slipping, and maintaining the angle of wrap at its widest points.

The General Electric Company has recently concluded negotiations by which it will still further strengthen its position in the Japanese field. The Japanese subsidiary of the General Electric Company will consolidate with the Shibaura Engineering Company, Tokio, the merged companies manufacturing electrical supplies and furnishing the bulk of the product used in Japan. The merger will add several hundred thousand dollars of gross yearly to General Electric sales, but is chiefly interesting as an evidence of the hold the American company has on the electrical field in the East.

A Heavy Langelier Swaging Machine.

The swaging machine illustrated is designed for tapering heavy work. It swages solid stock up to 2 in. diameter and tubing up to 3 in., and is especially intended by its builder, the Langelier Mfg. Company, Providence, R. I., to meet the wants of manufacturers of heavy tubing for automobile builders. The machine is built to take dies from 4 to 8 in. long, determining the length of taper. In the machine shown the dies are 8 in. long, 3½ in. wide and 2⅝ in. high.

Fig. 1 shows the machine ready for operation, Fig. 2 the mechanism of the head, the front cover being open and the front section of the cage removed, and Fig. 3 details of the type, with its dies, hammer blocks and rolls. The working parts are extra heavy; their proportions are such as to absorb the intense vibration which always exists in a swaging machine while it is in operation. In this type a squeezing blow is given the dies. The hammer blocks *a*, actuating the dies *b*, Fig. 3, revolve with the spindle and strike the rolls *c*, causing them to rotate around the spindle in their cage *d* inside of the steel ring *e*. This action prolongs the blow, which is desirable, in the company's experience, where there is a large amount of metal to reduce. In the lighter machines which the company builds stationary rolls are employed, which give quick, sharp blows.

Hand feed is employed, except with some special work. For certain shapes or where absolute concentricity is desired, necessitating great accuracy, special holders for feeding are used.

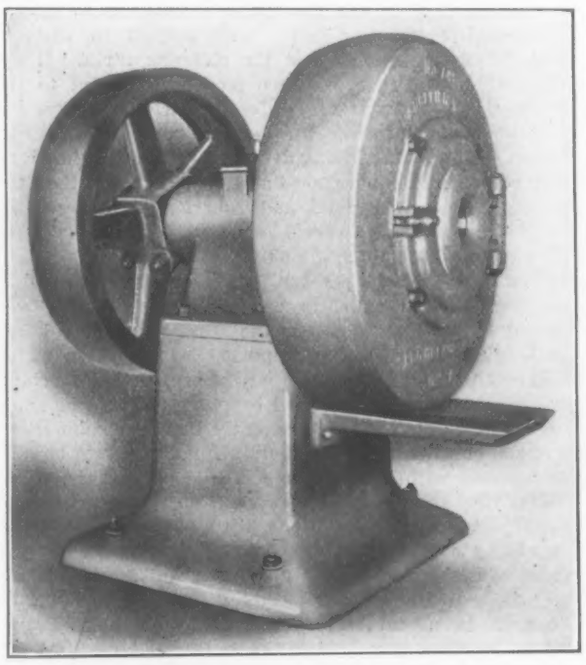


Fig. 1.—The Heavy Swaging Machine Built by the Langelier Mfg. Company, Providence, R. I.

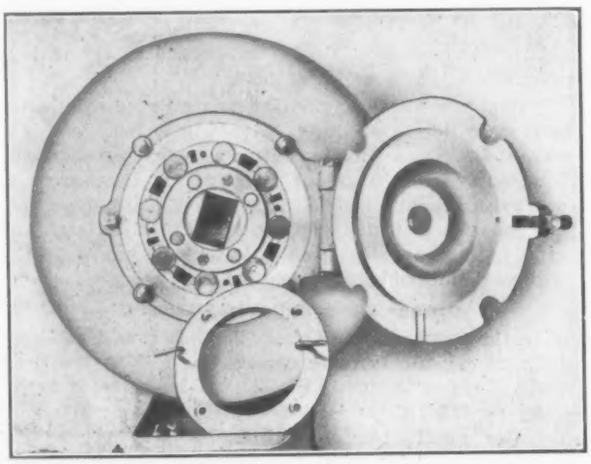


Fig. 2.—Head of the Machine Open, Exposing the Mechanism.

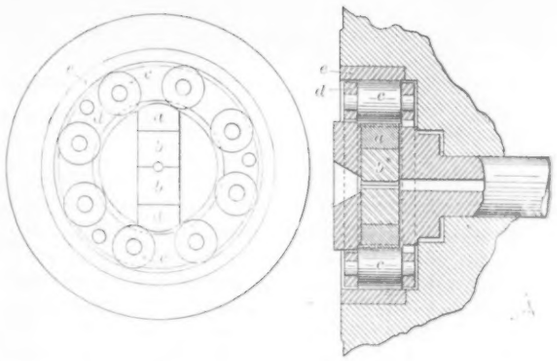


Fig. 3.—Details Showing How the Swaging Action Is Effected.

The spindle is of large proportions, its head being 10⅝ in. in diameter and 10⅝ in. long, while the bearing part is 6 in. in diameter and 23 in. long. The machine head, of gun iron, is 40 in. in diameter and 11 in. thick. The phosphor bronze roll cage, which is reinforced at each end by a crucible steel plate, is as light as consistent with strength. The rolls are of a special tool steel which the builders have found to stand best the severe duty that they have to perform, and are 2½ in. in diameter. The ring within which they travel with their cage is of hardened steel, ground accurately all over and forced into the head under a pressure of about 10 tons. As a precaution against the ring working loose under the continuous hammering four cap screws with washers under the heads bind it firmly in place.

The head of the spindle is slotted to receive the hammer blocks and dies; the slot is faced with hardened steel liners and its ends have hardened steel surfaces for the dies and hammer blocks to work against. This arrangement practically incloses the dies and hammer blocks in a hardened steel box and insures long life to the surfaces under contact. A heavy ring is tongued into the spindle to strengthen the open end of the slot. Two heavy conical pointed screws provide the means of adjusting the opening of the dies. Loose perforated cast iron bushings are used on the spindle, which reduces the surface velocity between the spindle and its bearing, increases the wearing surfaces and insures free lubrication the entire length of the bearing and the spindle.

The flywheel is 38 in. in diameter and is very heavy, weighing 1000 lb. The rim section is 3 in. thick and 7¼ in. wide. The hub is split and has one ⅞ x ⅞ in. key and two ⅞-in. bolts to bind it firmly to the spindle, an arrangement which the company has found effective in preventing the possibility of the wheel working loose. A rotary oil pump is furnished for forcing oil to all working parts of the machine; the oil is thoroughly filtered and returned to the tank inside of the base from which the pump delivers the supply. The front of the machine swings on a hinge and is fastened firmly in place when shut by a lift latch. The machine should run at a speed of 240 rev. per min. and should be connected to the countershaft by a 7-in. belt. The countershaft has tight and loose pulleys, 18 in. in diameter and 8-in. face, and should run at 304 rev. per min. The floor space required is 42 x 48 in.

The Lynchburg Foundry Company, Lynchburg, Va., owning and operating the McWane Pipe Works and the Radford Pipe Works, making cast iron pipe, has opened a Western office in rooms 508-509 Monadnock Building, Chicago, with John R. McWane, Western sales manager, in charge, who will sell the company's product in the following territory: Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North and South Dakota, Nebraska, Kansas, Colorado, Wyoming, Montana, Idaho, Utah, Nevada, California, Oregon and Washington. The company is now prepared to furnish cast iron bell and spigot and flanged water and gas pipe in sizes 3 to 36 in. in diameter, inclusive, its works having a daily output of pipe and special castings of 175 tons.

South African Trade Conditions.

Emerging From Seven Years' Depression.

BY A SPECIAL CORRESPONDENT.

By way of introduction, mention must be made of the new epoch into which South Africa will shortly emerge. The unification of the several States into a consolidated form under the union government will, it is hoped, spell the deathknell of racial, political and tariff barriers, which have for so long rendered general progress impossible. Already signs are not wanting that the future will, with the advent of the inauguration of the new government after May 31, 1910, burst into full spring bloom. For several months new companies have refrained from commencing operations and established firms, though sorely in need of larger workshops, factories, or additional plant, have hesitated to move, solely on account of the political fickleness generally prevalent regarding the fate of the great movement for federation or unification. Undoubtedly such restricted commercial activity has affected the country considerably and caused an almost irreparable loss to the sinews of industry in the shape of a general exodus of skilled workers to other lands. However, at the present time optimistic assurances from every quarter point to the fact that the corner is now turned.

Transvaal Shows Increasing Activity.

Floods, fires and gales are factors which have recently accounted for much damage to life and property in various parts of the country. The terrible damage by floods in the Transvaal, particularly in and around the Witwatersrand, gave cause for alarm. A personal inspection of the country revealed the fact that much more damage was incurred than was at first reported; railroads were washed away, mines flooded and bridges and smaller properties destroyed in all directions, involving some loss of life. A sequel to the flood thereabouts was that building operations in and around Johannesburg had to be suspended for some two months, owing to the condition of the brick yards, which rendered the supplying of bricks temporarily impossible. At the present time, however, conditions are again normal and renewed energy is evinced in the Golden City. Indeed, there is a boom just now in building. Plans involving an expenditure of £800,000 ($4,000,000) have been passed by the Johannesburg municipality this year, exclusive of £125,000 ($625,000) just sanctioned for the erection of a Town Hall. Several new mining properties are also being opened up in and around the Rand.

Pretoria, the seat of the future administrative government, has borrowed £1,000,000 ($5,000,000) with which to effect improvements to the town, including a new railroad station, municipal sanitary scheme, &c. Should funds allow, it is possible that the existing horse car service will give way to cars electrically propelled. The Transvaal Government has decided to encourage smelting by offering a bonus of 15 shillings ($3.75) per ton on all work turned out for the first year, and tapering away to nil in 10 years.

It is understood that the small electric furnace to be ordered for the Central South Africa Railways workshops in Pretoria is not intended to compete with private enterprise, but is to be used chiefly to demonstrate the possibilities in regard to Transvaal ores. So far experiments in this connection with local ores have been far from satisfactory; but it appears that besides the foregoing the authorities will center their efforts toward a scheme for working up some of the huge amounts of scrap metal, of which there are thousands of tons, into useful castings. The Chief Inspector of Machinery for the Transvaal, in company with F. W. Harbord, an authority well known in the United States and Canada, has left on a tour of inspection. All the most up to date steel works in Great Britain, Germany, Sweden and the United States are to be visited.

Railroad Developments.

Mr. Elliot, chief mechanical engineer of the Central South Africa Railways, is also leaving shortly in order to investigate the evolution of locomotive practice and manufacture in the United States. In some quarters, it is thought, that this move is a preliminary toward the manufacture of locomotives in the Pretoria workshops; at any rate, the manufacture of locomotives locally is scarcely possible in existing circumstances without incurring a very heavy expenditure in the shape of machinery to tackle boilers, frames, &c. A type of engine much favored here is the Kitson-Meyer, but apparently a much heavier engine is required, and toward this end designs are being prepared. Designs are also in hand for a new type of engine for local railroad service for use on the Johannesburg suburban lines.

At this juncture it is necessary to point out to American steel makers, especially those engaged in the manufacture of steel rails, that, in common with their Canadian and British competitors, they cannot hope to secure much of the future business emanating from South Africa in view of the revelation recently made by the Transvaal Treasurer-General with respect to what is undoubtedly an anomaly in the shipping tariff. It appears that tender forms were recently sent out to the leading manufacturers in different parts of the world for the supply of rails for new railroads and maintenance. After summarizing details it was found that Russian rails could be purchased at 10 per cent. less than the ruling prices in England and America. Nor was this all. The Treasurer-General explained that a saving of 30 per cent. in freight, making a difference in all of 17 shillings ($4.25) per ton, could be effected by purchasing Russian rails, and, therefore, the order was placed in Russia. Whether the Russian rails will last as long as those hitherto imported is a question which will be answered only after years of use. It is important, however, that American steel companies should be made cognizant of the facts. Apparently British combinations and the great American makers are not likely to be able to compete with the Russians in this part of the world unless they come down 10 per cent. on ruling prices and make successful negotiations with shipping companies regarding a revision of existing freight charges. The chief causes governing the above state of affairs are attributable to the subsidies allowed by the Russian Government to manufacturers and the fact that Russian trade, for some reason unknown to the writer at present, is not under the influence of the Shipping Conference. It would be to the advantage of American and Canadian manufacturers to investigate this matter fully, in view of the loss of trade to them that is likely to result therefrom, especially as arrangements for the supply of rails, &c., for the new lines, already sanctioned by the various parliaments, have yet to be made.

From July 1 important changes in railroad rates came into operation respecting goods imported into the competitive area—*i. e.*, between Pretoria, Springfontein, Vereenizing and Klerksdorp, inclusive. Ironware and hardware generally benefit to the extent of $0.57 per ton. The reductions, which apply equally to the Natal and Cape ports, have been made in accordance with the Transvaal-Mozambique convention.

Orange River and Natal Affairs.

In the Orange River Colony there is considerable activity among the farming community, and undoubtedly this will give stimulus to commercial interests; but generally speaking there is little worthy of note to manufacturers apart from normal trade. The prospecting operations at Ladybrand for petroleum do not justify more than passing reference. At Bloemfontein repairs

to the government buildings, recently destroyed by fire, involving the expenditure of several thousands of dollars, are being proceeded with.

Natal is exuberant at the prospects in store regarding the establishing of iron works at Sweetwaters, just outside the capital. It appears that an old experimental furnace used by a local firm years ago has been taken over by the Maritzburg Iron Foundry Company. This concern has already turned out a considerable quantity of pig iron of excellent quality. Iron ore is abundant. About 250 acres of land, containing iron ores yielding 50 to 62 per cent. of metallic iron, have been purchased. Fire clay, gannister, sand and kaolin are obtainable in the neighborhood. The output at present is 8 tons per day, but a larger furnace capable of producing 14 tons per day is to be erected forthwith. Already business with the Rand and Cape Colony is being negotiated, and it is stated that the cost approximates that in Scotland or Middlesbrough. The Natal Government railroads have experienced an unprecedented influx of trade from the Orange River Colony in the shape of large consignments of maize, averaging 10,000 tons per week. The local collieries have also been unusually busy. The combination has resulted in a glut at the receiving centers and has necessitated a Government inquiry being held at which it was decided that additional rolling stock should be ordered immediately in view of future contingencies of a like nature arising. This is the second time within a year that the railroad system has been temporarily paralyzed, notwithstanding the fact that additional rolling stock was ordered and installed. In this instance the Government has ordered 21 engines and 150 cars for delivery before the end of the present year.

The remarkable activity among the farming community in the Transvaal and Orange River Colony is the outcome of the better facilities provided by the Central South Africa Railways in the shape of extended lines for the disposal of produce. According to statistics just announced, 163¼ miles of new railroad was completed by the administration last year. The Kimberley-Bloemfontein line, two years old, has been responsible in the main for the present situation in Natal, previously mentioned. Railroad development on the whole has been somewhat restricted owing to the anticipated unification scheme; nevertheless, a few new lines have been completed in all the colonies. One of the first branch lines to be commenced forthwith is that from Pietersburg to Loutpansberg (Transvaal) involving an expenditure of £800,000 ($4,000,000), and with the advent of the union Government next year there is every reason to anticipate that the new lines already sanctioned in the several colonies will be commenced almost immediately.

Rhodesia a Land of Promise.

Rhodesia is beginning to boom, after remaining practically dormant since the beginning of the late war. At Abercorn a new gold field has been discovered which is considered to be a veritable Eldorado. Capitalists, prospectors and others are wild with excitement. Since 1893 Rhodesian mines have yielded £13,000,000 ($65,000,000) worth of gold. A favorite mill in Rhodesia is the Tremain stamp. At present there are over 70 mills of this description in operation throughout the country. Portability, combined with lower cost, makes them popular for small propositions, where the grade is high and the development is not sufficiently large to warrant the capital expenditure necessary to erect a 5 or 10 stamp mill. Rhodesia is highly mineralized, but so far as gold is concerned it is a country for the small man, generally speaking. Grinding pans of the Cobbe-Middleton type are wanted. Agents are receiving constant inquiries for these machines or modifications.

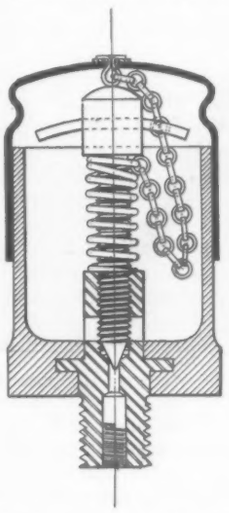
The Benguella Railway, from the Zambesi to the Congo border, is well under construction, 70 miles of earthworks and 35 miles of completed railroad being the record to date. The project is costing £5000 ($25,000) per mile and is well backed as regards capital. When this line is completed Rhodesia will have a service of 3500 miles of railroads. At the Star mine, to which the new railroad is pushing, a plant capable of producing 2500 tons of copper annually is being constructed. Since the Chartered Company has revised its land laws settlers are crowding into Rhodesia, and when it is remembered that one stipulation is that each settler must possess at least £500 ($2500) in cash or its equivalent, it is easy to conjecture what the future of business there will be.

In order to reassure manufacturers that South Africa is really recovering from the past seven years' depression, it is only necessary to quote statistics in summary. The Cape has recovered so far that equilibrium between revenue and expenditure has been effected. The Transvaal treasury has a surplus of £60,000 ($300,000). Natal and the Orange River Colony, though not enjoying such prosperity as the Transvaal, are endeavoring to restore more confidence by decreasing their annual deficits. Moreover, during the first six months of the current year £9,601,000 ($48,005,000) new capital found its way into the country, an increase of £6,614,000 ($33,073,000) over that for the same period of 1908. The increase is a clear indication of a revival of outside confidence in the country.

For the past six years American firms, in common with those of other nations, have displayed a reluctant spirit toward South Africa. German manufacturers, on the other hand, took advantage of a falling market with singular pertinacity, and statistics show that they increased their business from 3.2 per cent. in 1904 to 8.7 per cent. in 1908. American and British firms, who usually occupy a relative position, approximately speaking, allowed their business with South Africa to decline from 62.4 per cent. in 1904 to 54.2 per cent. in 1908.

The U. S. Indestructible Oil Cup.

A sectional view is given herewith of the new indestructible oil cup which is being manufactured and placed on the market by the United States Metallic Packing Company, Philadelphia, Pa. It is designed to have a maximum strength at a minimum cost. The shank of the cup is of machinery steel and it is consequently impossible to break it when screwing down the same, as is sometimes the case with the brass cup of similar design. The cover is of pressed steel and is attached to the body of the cup by a steel chain. This precludes the possibility of losing it by its jarring off, or, as is often the case with brass cups, particularly on locomotives, from stealing.



The Indestructible Oil Cup Made by the United States Metallic Packing Company, Philadelphia, Pa.

The indestructible oil cup will be furnished either with a needle or wick feed, as may be desired, and with shanks of any desired diameter and number of threads. The standard cup, as shown in the illustration, has a ¾-in. diameter shank and 14 threads. The method of manufacture of this cup makes it possible to sell it at a low figure, and this, together with its mechanical features, will, it is believed, make it quite popular.

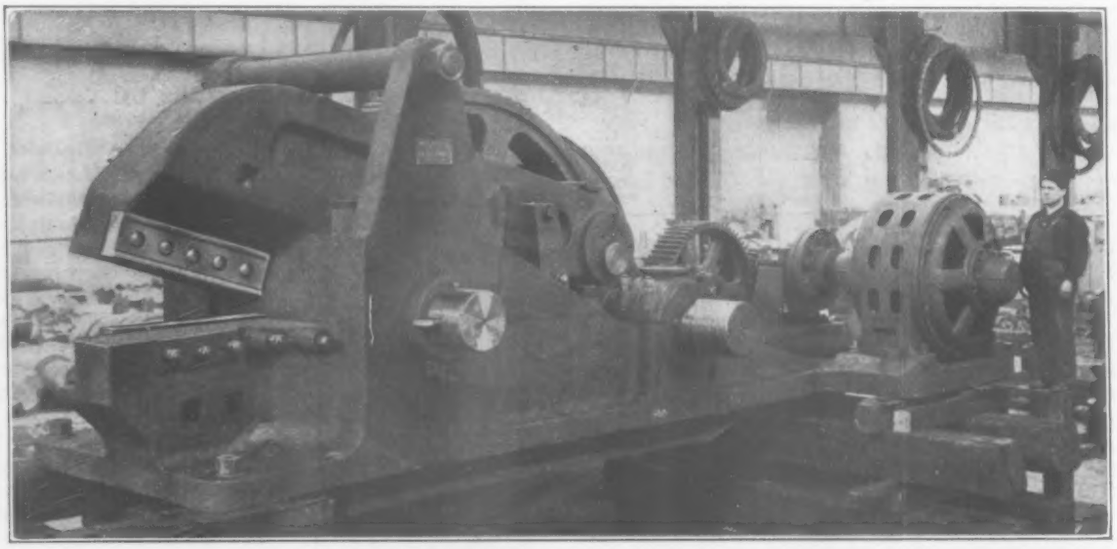
National Steel Boiler Tubes.—Clifton Wharton, Jr., manager of sales, National Tube Company, 30 Church street, New York, has issued a circular under date of September 7 discussing the subject of steel versus iron boiler tubes. The circular sets forth the merits of the Spellerized steel tubes manufactured by this company and which are offered in the place of charcoal iron boiler tubes. The National Tube Company is so convinced of the superiority of its lap welded Spellerized steel boiler tubes and Shelby cold drawn seamless steel that it has discontinued absolutely the manufacture of charcoal iron. The circular says: "We are satisfied that either lap welded Spellerized or Shelby cold drawn seamless steel tubes will give better service at a decreased cost."

A Mesta Large Steel Lever Shear.

One of two large shears built for the Indiana Steel Company's plant at Gary, Ind., is shown in the illustration as it appeared in the erecting shop of the builder, the Mesta Machine Company, Pittsburgh, Pa. It is the low knife type design, with knives 36 in. long, and will make 12 cuts per minute of cold soft steel 6½ in. square or 7 in. round. It is driven by a 150-hp. induction motor running 375 rev. per min. These shears are claimed to be the largest of the lever type ever built and are made entirely of steel castings and steel forgings, except the flywheel, which is made of air furnace melted iron. The total weight of each shear, not including the motors, is 225,000 lb. The gear shield, not shown, weighs an additional 9000 lb.

The main gear drives the crank shaft by a jaw clutch pulled out of mesh by a sliding pin. The sliding pin is operated by a 5-hp. direct current motor. The main frame is a single steel casting, thoroughly annealed, which is about 7 ft. wide by 23 ft. long and weighs 85,000 lb. The lever is of cast steel, well annealed and bored for a main pin 13 in. in diameter. A bronze bearing is pivoted in the tail end of the lever to receive the pressure from the upper end of the pitman. The main gear is of cast steel, machine molded, is 10½ ft. in diameter, and has 88 teeth of 4½-in. pitch, 17½ in. wide over the shrouds. The gear and clutch are bushed with bronze. The main pinion, also machine molded, is of cast steel, thoroughly annealed, and has 12 teeth. The motor gear is of steel and has 66 machine cut teeth 1½-in. diametrical pitch and 10-in. face; the pinion has 18 teeth. The flywheel is of air furnace iron, 9 ft. in diameter and weighs 25,000 lb. The main pin is of steel, 13 in. in diameter, and the crankshaft of steel, 14 in. in diameter and 13 ft. long. The bearing in the frame at the main gear is 14 x 24 in. and the other bearing in the frame is 14 x 19 in. The pinion shaft is 10 in. in diameter by 20 in. long in the bearings. The knives are of high grade tool steel, with four cutting edges, and are 3 x 8 x 36 in. The clutch operating mechanism is self-contained and mounted on a substantial base.

The first shear as installed at the Gary works has a gag at one side (not shown in the illustration) for holding the billet in place during the cutting operation. The success of this shear resulted in the company's placing an order for another shear of the same capacity, but of the high knife design, with knives 44 in. long, which is now under construction at the Mesta Machine Company's West Homestead, Pa., plant. The company reports that the advantage of using steel castings in the construction of shears for specially heavy service has led several concerns to order similar but somewhat smaller shears.



The Largest Lever Shear in the World as It Appeared in the Erecting Shop of the Mesta Machine Company, at West Homestead, Pa.

A New Crane Iron Works Furnace.

The new No. 2 furnace which was recently put in blast by the Crane Iron Works of the Empire Steel & Iron Company, Catasauqua, Pa., is built on top of the stonework of the old No. 5 furnace of the Catasauqua group. This stone construction at the base of the No. 5 furnace is what was customary in earlier blast furnace erection when the builders could not get a hill against which to back up the furnace. The new Catasauqua stack has rolled structural steel columns instead of cast iron or built-up steel columns. They are 30 ft. long and were rolled by the Bethlehem Steel Company. The furnace is 80 ft. high by 17 ft. 6 in. bosh, and the hearth and top diameter are both 11 ft. 6 in. There are 12 tuyeres. The mantle of the furnace is 30 ft. above the hearth level. The bosh is a petticoat construction and is cooled by two rows of plates immediately above the tuyeres; from that point up to the mantle by sprays of water. There are three 20 x 90 ft. side combustion stoves fitted with Roberts brick.

The cast house is of concrete construction up to the working floor. Above that there is steel construction with a thin layer of brick. Between the concrete walls to within 4 ft. of the pig bed is a filling of liquid slag. Breaker blocks are set on pilasters of the concrete wall and the top of the breaker is about 2 ft. below the level of the pig bed floor. These breaker blocks are of cast iron with a railroad rail on top for protection. Pig iron is dropped on the breaker block, and thus broken in two pieces, which pass over a railroad iron apron and fall into the car. The sand drops from the railroad iron and is caught, so that it does not get into the car. The trestles for raw materials are concrete piers spaced 30 ft. centers. The rails are supported by 30-in. Bethlehem I-beams. The furnace was built with four downcomers and has a Mullen combination dust catcher and gas washer. The two blowing engines are of the Southwark long crosshead disconnected type. The boiler plant consists of four Rust boilers.

The official report of building operations for August from 45 cities in the United States, as indicated by the filing of plans for new structures, shows an aggregate gain of 38 per cent. in value as compared with August, 1908. In New York City between January 1 and September 4 2479 buildings were projected, estimated to cost $129,948,000, as against 1542 in 1908 to cost $65,650,000. As is well known, the activity in filing plans in New York City in the past year has been due in part to anticipation of changes in the building code. The figures are compiled by the *American Contractor*. Building operations throughout the country are considered more than fair, and the prospects for the future are encouraging.

The American Locomotive Company.

The American Locomotive Company has issued its eighth annual report, which deals with the business of the company for the fiscal year ending June 30, 1909. The showing made is not an agreeable one for the stockholders, but as the corner has been turned and the country is again headed toward prosperity, the fiscal year now passing will yield much better results. Following is a summary of operations, including the Montreal plant, for the year ending June 30, 1909, as compared with the previous year:

	1908-9.	1907-8.	Decreases.
	$	$	$
Gross earnings	19,008,633.97	37,484,417.39	18,475,783.42
Manufacturing, maintenance and administrative expenses	17,665,962.38	32,497,627.32	14,831,664.94
Net earnings	1,342,671.59	4,986,790.07	3,644,118.48
Interest, &c., on bonds of constituent companies, coupon notes, &c.	355,532.36	460,042.02	104,509.66
Profit	987,139.23	4,526,748.05	3,539,608.82
Dividends on preferred stock at 7 per cent.	1,750,000.00	1,750,000.00	
Dividends on common stock at 5 per cent.	.....	1,250,000.00	1,250,000.00
Surplus	762,860.77*	1,526,748.05	2,289,608.82
Reserve for replacements and maintenance	.....	500,000.00	500,000.00
Net credit to profit and loss	762,860.77*	1,026,748.05	1,789,608.82

*Deficit.

The condensed general balance sheet as of June 30, 1909, is as follows:

Assets.

Cost of property		$49,757,745.74
Securities owned:		
Richmond Locomotive & Machine Works consolidated mortgage gold bonds		118,000.00
Sundry securities		832,300.00
		$950,300.00
Convertible assets:		
Cash		$4,672,041.52
Accounts collectible		5,116,924.71
Bills receivable		1,313,493.87
Accrued interest		11,490.00
Material and supplies		3,058,519.33
Contract work in course of construction		1,042,215.92
Steam shovels, contractors' locomotives and automobiles manufactured for stock		387,870.68
		$15,602,556.03
Notes discounted* (per contra)		$2,407,604.52
Total		$68,718,206.29

*Equipment trust notes secured by lien upon locomotives.

Liabilities.

Capital stock:		
Preferred		$25,000,000.00
Common		25,000,000.00
		$50,000,000.00
Bonded debt of constituent companies:		
Richmond Locomotive Works		$550,000.00
Dickson Mfg. Company		562,500.00
Rogers Locomotive Works		330,000.00
Montreal Locomotive Works		1,500,000.00
		$2,942,500.00
Current liabilities:		
Gold coupon notes		$3,000,000.00
Accounts payable		977,903.63
Accrued interest		73,187.50
Unclaimed interest		662.50
Dividends on preferred stock payable July 21, 1909		437,500.00
		$4,489,253.63
Indorsements (per contra)		$2,407,604.52
Extraordinary additions and betterment fund		1,172,497.05
Profit and loss:		
Balance June 30, 1908	$8,469,211.86	
Deduct deficit as shown in summary of operations	762,860.77	7,706,351.09
Total		$68,718,206.29

President W. H. Marshall in his accompanying remarks says:

Attention is called to the fact that a fund of $500,000 was set aside last year for the maintenance of the plants. This sum has been so spent and the maintenance charges in excess thereof included in operating expenses. In the report of last year it was predicted that the resumption of business would not take place in time to prevent a material decrease in earnings for the present year. As a result of the extreme business depression in this and foreign countries, the output of locomotives was the lowest of any year in the history of the company, the effect of which is shown in the following comparison of gross earnings:

Year.	Gross earnings.	Year.	Gross earnings.
1908-9	$19,008,634	1904-5	$24,150,201
1907-8	37,484,417	1903-4	33,068,751
1906-7	49,515,486	1902-3	33,105,725
1905-6	42,547,876	1901-2	26,398,394

Orders were taken on small margin of profit in an effort to keep the plants running and preserve, as far as possible, the organization, so that the manufacturing operations would not suffer from disorganized and inexperienced forces upon the restoration of business. The small margin of profit and the fact that production at its lowest was only about 17 per cent. of normal explains the large percentage of expenses to gross earnings and the deficit after the payment of the preferred dividend.

Advantage was taken of the period of inactivity in the shops to install additions to and betterments of plant equipment and methods, which, with the purchase of land at Gary, Ind., amounted to $816,587.62, thereby reducing the balance last year in the extraordinary additions and betterment fund from $1,989,084.67 to $1,172,497.05.

While the business of the country is rapidly resuming normal proportions, the locomotive business, because of its nature, will be among the last to enjoy complete restoration, but with the full belief in the future prosperity of the country and the resulting growth in the business of the company, as well as to take advantage of the prevailing low prices of material and the facility and economy in making improvements when the plants are not in full operation, plans have been prepared and contracts made for extensive improvements at the larger works which are located at Schenectady, Dunkirk, Pittsburgh and Richmond. This will result in a largely increased capacity even after the permanent shutdown of the smaller and less economical plants which is contemplated. A reduction in the manufacturing costs is expected as a result of this policy of concentration in a few large plants of the entire locomotive output of the company.

This plan also includes the transfer to the Rogers Works at Paterson, N. J., of the manufacture of steam shovels and small contractors' locomotives, heretofore built at Richmond, Va., and Scranton, Pa., respectively. The Rogers Works is being rearranged and equipped solely for the manufacture of such product. It is estimated that an expenditure of $3,500,000 will be required to carry out the improvements outlined above. Financial arrangements are being made to reimburse the treasury for this amount and to provide additional working capital necessary to conduct the greater volume of business made possible by the increased facilities.

The company has purchased 130 acres of land at Gary, Ind., from the Gary Land Company, preparatory to the building of a new plant in this desirable location.

During the year the sales of automobiles have greatly increased and the results in the operation of the automobile department have been so satisfactory as to warrant a further increase in the capacity of the Providence factory, which has been accomplished largely by remodeling a number of adjacent buildings abandoned by the locomotive plant when it was shut down last year.

The London *Economist's* index number of commodity prices was 2255 for September 1, as against 2254 August 1, 2240 July 1, 2225 June 1, and 2197 May 1. The September number is the highest since April, 1908, and compares with the September numbers of other years as follows: 2168 in 1908, 2519 in 1907, 2341 in 1906, 2212 in 1905, and 2141 in 1904.

The Mexican Horse Shoe Trade.

BY A MEXICAN CORRESPONDENT.

Any one who studies a map of Mexico, with the routes of the different railroads marked thereon, now totaling about 25,000 km. (15,500 miles), will not fail to note that, with one or two important exceptions, they consist of lines running from north to south. Very large areas of the country, by no means unsettled or undeveloped, seeing that important mining enterprises are there carried on and large bodies of land are regularly cultivated, are still without modern transportation facilities. Between these settled districts and the railroads, be the distance far or short, the products, whether of mine or hacienda, have to be carried by either horse, mule or donkey. The same methods are employed in the transportation to the cities of the varied commodities brought in daily from the country, such as wood, charcoal, &c. Mules and donkeys also are employed in very larger numbers at the mines and ranches at the regular daily work. It would be a mere guess to estimate the proportion of the actual carrying business of the entire country which is to-day performed by four-footed freighters, but it is undoubtedly large, notwithstanding the activity of the railroad companies in making new extensions yearly in to virgin territory.

The Number of Freight Animals in Mexico.

In order to obtain a working basis for the preparation of an article for *The Iron Age*, which might present some facts of interest, if not of actual value, to manufacturers of machine-made horse and mule shoes, which are almost unknown in Mexico, the writer addressed an inquiry to the Department of Fomento asking for data in relation to the number of horses, mules and donkeys in the republic. He received in due course a large volume of statistics from the Direccion General de Estadistica, compiled under the direction of Dr. Antonio Peñafiel, dated 1902, in which, among much other information relating to live stock, the figures asked for were given in detail for cities, towns and hamlets. A summary by states is here presented:

Census of Freight Animals in Mexico in 1902.

States.	Horses.	Mules.	Donkeys.
Aguascalientes	4,991	3,248	3,042
Baja California	8,655	3,429	2,179
Campeche	2,969	3,031	944
Coahuila	55,825	10,978	6,487
Colima	4,321	2,453	874
Chiapas	42,427	5,896	561
Chihuahua	59,667	9,401	26,544
Distrito Federal	834	1,435	466
Durango	104,674	32,931	28,109
Guanajuato	31,396	15,547	40,948
Guerrero	16,140	4,348	6,330
Hidalgo	8,636	8,382	4,553
Jalisco	70,877	27,497	16,990
México	11,317	9,365	3,029
Michoacán	54,548	26,390	15,106
Morelos	9,255	7,830	4,210
Nuevo León	28,088	7,514	15,969
Oaxaca	12,854	3,214	2,515
Puebla	9,526	25,602	6,661
Querétaro	8,333	5,378	5,778
San Luis Potosí	36,340	12,219	21,905
Sinaloa	6,594	5,618	6,989
Sonora	52,033	11,534	13,338
Tabasco	20,160	3,276	259
Tamaulipas	69,611	14,447	10,291
Tepic	13,086	8,968	5,399
Tlaxcala	2,682	14,877	2,146
Vera Cruz	40,914	10,574	5,988
Yucatán	15,700	13,318	537
Zacatecas	56,764	25,735	29,844
Total	859,217	334,435	287,991

No returns are given from some places. Further, the total shown is undoubtedly an under estimate, as any one at all familiar with the habits and manner of thought of the Mexican small proprietor, who has ever before him the fear of more taxation, will at once understand. The total could be increased one-third, probably, without exaggerating the situation. But, even taking the figures as they are, we have considerably more than 4,000,000 hoofs, the greater number of which need to be newly shod several times a year.

It appears to an observer that this great market for the sale of machine-made horseshoes has up to the present time been entirely ignored by American manufacturers. During a long residence the writer has never seen a machine-made shoe in Mexico, although there is a tradition among the local small forge proprietors that foreign machine-made shoes have been seen in kegs in supply stores. As these stores, in Durango at least, are conducted by Germans, American products, unless appealing to them in some special way, are not likely to be actively pushed.

The very large demand in Mexico for the class of articles in question has led the writer to investigate the matter, not perhaps as thoroughly as one more familiar technically with its intricacies might have done, with the hope of finding out just why it is that the demand indicated is filled by the local blacksmiths from their small forges with comparatively inferior hand-made shoes.

The Cost of Mexican Hand-Made Shoes.

An interview was sought with one of the principal blacksmiths. He stated that 10 cents, Mexican, would cover the entire cost of manufacture of a set of four of the smallest sized shoes—that for donkeys. The average product turned out in a working day of the different sizes of shoes by two men and a boy is from 4½ to 6 doz. sets of shoes—that is, 216 to 288 separate pieces. The workers' wages are: smith, $1.50; helper, 75 cents; boy, 25 cents. The blacksmith further asserted that frequently shoes are made from iron which has been stolen, and that this product is disposed of at less than legitimate prices to the injury of the regular trade. The prices at which the forgers dispose of their wares to the stores and supply houses are variable, and seem to depend upon the necessities of the blacksmiths and the prospects for sales entertained by the merchants. Thus a few cents more per dozen sets may be obtained at one time than at another.

A few days after the interwiew with this blacksmith the writer had an ocular demonstration of the low prices at which these products could be bought in the public market, where many different kinds of metal articles are sold. He saw a ranchman buy six sets of donkey shoes at 15 cents a set, and one set of horseshoes for 25 cents—that is to say, 28 separate shoes, hand made, for $1.15 Mexican currency. Prices in the public market are lower than in the regular stores. The shoes spoken of were new, and of the customary sizes and patterns. The traders pick them up in odd lots from the needy workmen or from others who have come into possession of them illegitimately and are satisfied with a smaller profit than the regular storekeepers make. The smallest shoe sold by the iron dealers in the public market at from 15 to 18 cents per set of four would cost in the stores at least the latter rate per dozen sets. Shoes for mules sell in the market for 20 cents per set, and horseshoes for 25 cents. As in all Southern countries, horses and mules are much smaller and lighter than those bred farther north. While there are a few American draft horses in Mexico, the very large imported stock is entirely absent. A larger sized shoe is, however, made for American horses, and they sell as high as $2 per set, Mexican money.

The ordinary horse, mule and donkey shoes are retailed in almost every grocery and hardware store. As articles of commerce they may be said to be as staple as flour, corn or sugar. Very large numbers are sold daily in every town and city the country over. The three classes of shoes enumerated weigh, respectively, 730, 680 and 470 grammes, or 26, 24 and 16½ ounces. The measurements are: Horseshoe, outside circumference, 11 in., extreme width inside 3¼ in.; mule shoe, 10⅛ in. and 2 9-16 in.; donkey shoe, 8⅝ in. and 2 in. The weights given, however, are not arbitrary; sometimes they run both heavier and lighter.

To return to the matter of prices. From the best information obtainable, it seems that the supply houses obtain their stocks of shoes from the blacksmiths at the following rates: Horse shoes, $2.50 per dozen sets of four; mule shoes, $2.25, and donkey shoes, $2. With reference to quality, it may be said that the work turned

out by the small forges engaged in this industry is good. The adjective applies to both the appearance of the article and its durability. While a little rough, lacking as they do the shapeliness and smoothness of machine-made, swaged and tumbled shoes, the article of domestic make is sufficiently good for all practical purposes.

Iron Costs and Rates of Duty.

The iron from which the shoes are made costs the blacksmiths 16 cents per kg. (2.2 lb.), and that consumed in the Durango District is produced in Monterey and Chihuahua. Probably some foreign stock is also used, it being questionable whether domestic iron plants can supply the entire demand. Under the increased tariff on iron and steel manufactures which went into effect last year, "iron in bars, of all forms and sections," pays a duty of $7 per 100 kg. (220 lb.) gross.

In preparing this article the writer has been prompted by the hope that the data presented might induce American makers of the products treated of to study the question involved, namely, the most practical way of obtaining a foothold for their manufactures in this extensive and profitable market. In considering the subject, the question of the tariff duty on horseshoes is, perhaps, the crux of the question, so far as regards the cultivation of this market by United States horseshoe makers. Under the existing law, shoes for animals must pay a customs duty of 15 cents per legal kg. (2.2 lb.). Avoiding fractions, and taking the kilogram at two pounds, this charge would approximate $3.75, gold, per keg of 100 lb. Although the terms of classification appear to be clear, the practices of customs authorities are often inscrutable. Correspondence upon this subject with the Mexican departments of the Treasury indicates a possible variation, under certain circumstances, from the rate of duty quoted in the tariff law. An experimental shipment would appear to be the best way to learn the amount of tariff duty which machine-made horseshoes, packed in 100-lb. kegs, must pay. If the high duty named in the schedule is a handicap which it is impossible to overcome, and one which precludes competition for the domestic trade in animal shoes, then the establishing of a branch manufactory in the republic is a step which appears to be well worthy the consideration of those engaged in this industry. During the past 10 or 15 years one or two concessions have been given by the government for the introduction of such an enterprise, but so far as the writer has been able to discover no such work has come into being.

The Connellsville 500-Hp. Mine Hoist.

Additional information received too late to be incorporated in the description of the Connellsville 500-hp. mine hoist installed at the Star Junction mines of the Washington Coal & Coke Company, printed in *The Iron Age* September 9, 1909, is given in the following:

This hoist is hauling regularly 40 mine cars, weighing 5800 lb. each loaded, up an 8 per cent. grade at the rate of 600 ft. per minute. The hoist is fitted with one of the Connellsville Mfg. & Mine Supply Company's special built up, nonbreakable drums, and has the company's improved patented internal expansion band friction clutch, and an 800-hp. flexible coupling between the motor and the gear drive. A hand brake of sufficient power to lower a full loaded trip safely all the way down the slope is installed. The entire machine was built in sections so that it could be transported easily through the mine about a mile underground. Steel cut gears are used throughout. The drum shaft is 12 in. diameter, the intermediate shaft 9 in. diameter and the motor shaft 7 in. diameter. The motor runs at 300 rev. per min., and is controlled by an eight-point relay controller with a master switch.

The outfit complete is self-contained. It occupies a floor space of 18 x 19 x 10 ft., weighs 128,500 lb., and will pull a vertical load of 28,000. The drum will take 8000 ft. of 1⅛-in. wire rope.

Berlin is beginning to hear more frequently reports of growing trade activity in Germany.

Central and South American Notes.

SAN JOSÉ, C. A., August 18, 1909.—As luck would have it, the late earthquakes in these sections have caused little damage; with the exception of a few roofs, there was nothing like the havoc done last year, when wharves, railroad bridges and not a few public buildings suffered greatly.

The Bolivian muddle, which looked like a war that might involve Peru, Chile and Brazil, has now happily been averted. Much of the credit for keeping the peace in Spanish America this time is due to the United States. The new President of Bolivia seems to be an enlightened man, has been in foreign lands as a diplomatic official, and undoubtedly has the situation well in hand.

Bolivia, in the very heart of South America, is almost the last of these republics to be "discovered" by our people. It has always been difficult to reach this country, which is almost completely shut in by very high ranges and embracing some of the highest tablelands in the world. Its mines, beginning with the world-famous Potosi, first gave it a reputation; since then, gold, silver, tin, copper, iron and nitrates have been mined in the more accessible regions. No country needs railroads, bridges, aqueducts and steamboats quite as much as Bolivia. To-day much of the traveling and traffic is done on horseback or on mules. In fact, outside of a railroad line from the coast, almost all freighting is done by pack animals of different kinds. This is one reason why merchandise needs so much looking after in the packing for this and other Latin-American countries. Packages which are much over 150 lb. are unwieldy.

In the matter of railroads, the extension of the Mahlendo, Arequipa & South Peruvian to the interior of Bolivia is now being seriously planned. Then the Chilian or Arica Railroad is to be pushed over the tablelands and the spurs of the Andes to reach the navigable points on the Mamori and Madeira rivers, thus finally reaching the eastern coast of South America. The rubber districts near the rivers mentioned are among the best in the world, and whoever reaches them first by a system of good roads will open up a country abounding in rubber, coffee, mines and forests of mahogany, ebony and other precious timber.

Work on the free zone of the Port of La Platte, Argentina, is continuing actively. Work on the piers at Campana has been resumed. There is talk of a line of railroad to run southward from a point on the Transandine to Patagonia, south of the Rio Negro; this is mostly valuable grazing and wheat land. The large number of 255,000 immigrants landed in Argentina during the last fiscal year, and many are thinking of locating in the wheat belt.

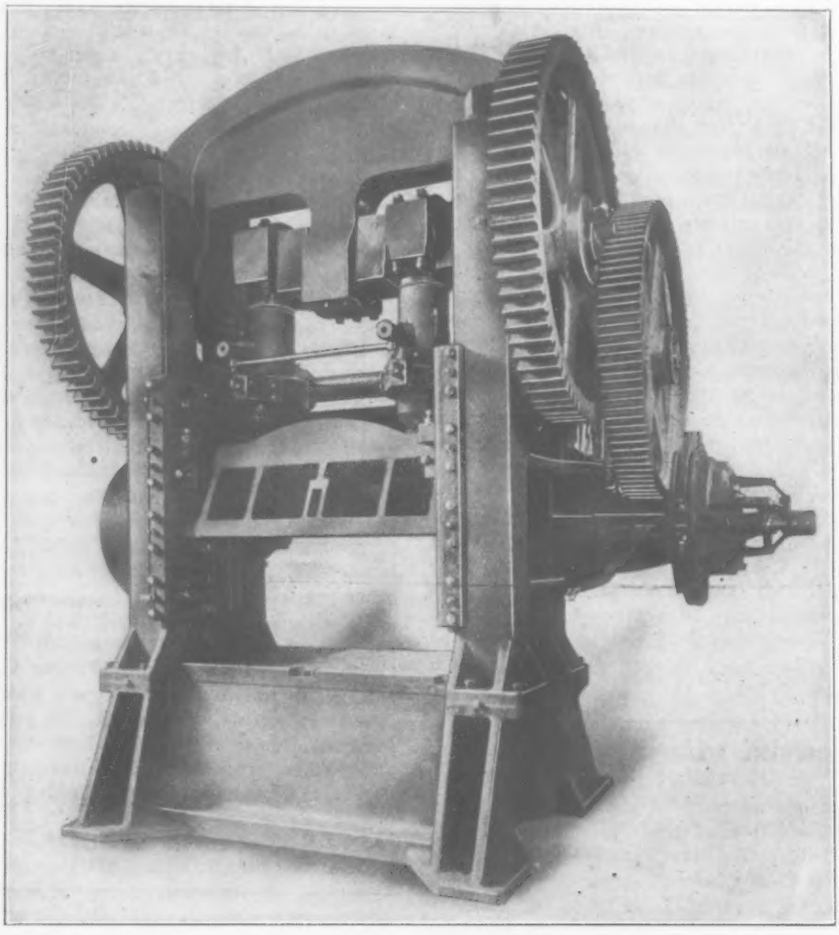
The total length of the Argentine railroads is 24,768 km. (15,390 miles), with 6500 km. (4039 miles) in construction. The amount of capital invested in Argentine Government lines is 423,000,000 francs ($85,000,000). Those represented by private enterprises (mostly British) have an aggregate capital of 3,765,000,000 francs ($750,000,000). C.

An Interesting Central Supply System.—The Oak Park Power Company, Flint, Mich., is arranging to enlarge its plant by the addition of three Parsons steam turbines, which will give an ultimate capacity of 4500 hp. One of these engines has already been installed and the other two will be added within a few months. The company furnishes power, light, steam heat, compressed air, drinking water and gas for brazing purposes to a group of factories, including the Weston-Mott Company, Buick Motor Company, Imperial Wheel Company, General Motors Company, Champion Ignition Company and others. Transmission lines are all carried in underground conduits, and electrical current for welding, light and power is metered separately to each consumer, as are also live and exhaust steam for heating and gas and compressed air. Contracts amounting to $80,000 have been closed for heating apparatus, and with its new improvements the plant when finished will represent an investment of $400,000.

A New Bliss Double Crank Press.

The machine illustrated is a double crank press, recently designed and built by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y. It is intended for heavy cold bending, drawing and forming operations in the manufacture of large parts from thick sheet steel, such as automobile engine crank cases, frame members, channels, &c., and also for heavy cutting and perforating and all general purposes where a very powerful press of a considerable width between the frame columns is necessary or convenient.

This particular machine is capable of a safe working pressure of 800 tons. The driving power is applied at both ends of the crank shaft, there being a large gear on each side of the press. This divides the bending and torsional strains on the crank shaft, relieving one crank of the duty of driving the other, and also greatly moderates the pressure on the main journals and the large gear teeth. The working pressure exerted by the machine is borne by four steel tension rods extending from underneath the ends of the bed through the bed frame columns and crown piece, binding these four members together. The frame columns are of heavy cored section surrounding the tension rods. The bases of these columns are broad and are bolted and doweled to the bed, independently of the tension rods, to secure ample rigidity for the resistance of side strains and to insure steady support for the bearings of the intermediate driving shafts attached to the rear of the press frame.



A Large Double Crank Press Built by the E. W. Bliss Company, Brooklyn, N. Y.

The slide has extra long guides to keep its lower surface parallel with the bed for cutting operations. The guiding ways in the frame columns are heavily gibbed and adjustable from the front to preserve alignment and compensate for wear. Provision is made in the slide, bed and columns for the application of direct knockout rods and front and back knockout bars. The pitmans have very large wearing surfaces. They are provided with screw adjustment so connected that the two pitmans are adjusted up or down simultaneously, insuring the keeping of the lower surface of the slide always parallel with the bed. The pitman screws are large and are of crucible cast steel. The crank shaft is of high carbon open hearth steel. The center bearing of the crown piece for receiving the upward pressure between the two cranks is strongly capped to receive downward pressure due to operations that involve heavy stripping. The back bearings that carry the intermediate gear shaft and driving shaft are very long and extra heavy, and are bolted to the frame columns through extra broad and heavily ribbed flanges and braces. The gear wheels are of cast steel, the pinions forged steel and the teeth in both are machine cut.

The machine is controlled by a hand lever operating a combined friction clutch and brake. This friction clutch is an improved type, developed to overcome difficulties commonly experienced with friction clutches under heavy duty. The friction surfaces are heavy and rigid and are arranged to be relieved of rubbing contact when not driving. The adjustment is convenient, and the driving parts as well as all of the clutch details are of extra size and proportions.

The flywheel, which also serves as a driving pulley, is not keyed directly to the shaft but is connected to a safety coupling of improved design, so that by the shearing of a safety bolt the flywheel is permitted to revolve idly if the press is subjected to a pressure greatly exceeding that for which it is intended. It also precludes danger of breaking the press if through neglect or oversight a hammer, monkey wrench or some other foreign article is left on the press in position to interfere with its working.

The following are some of the principal dimensions of the machine:

	Inches.
Width between frame columns	74
Width between gibs	67
Distance from bed to slide, stroke down and adjustment up	20
Adjustment of slide	6
Stroke of slide	14

The flywheel is 48 in. in diameter by 12½-in. face, weighs about 3500 lb. and makes 280 rev. per min. The total weight of the machine as shown is approximately 98,000 lb.

New Grant Rivet Spinning Machines.

Three new riveting machines have recently been brought out by the Grant Mfg. & Machine Company, Bridgeport, Conn. Figs. 1 and 2 show a riveter of the noiseless type, equipped with flat and horn tables, and designed for work requiring a great depth of throat, riveting work 11½ in. from the edge. Upon the flat table fixtures can be mounted for handling a large variety of product, which it would be impossible to reach under ordinary conditions in a riveter. With the horn table the machine is especially suited for use in the manufacture of railroad lamps, signal lamps, sheet steel stove ovens, metallic doors and similar work. It is similar in construction to the company's regular line, with some improvements. The heads are formed on the rivets by a rolling process under pressure, no blows being struck, which does away with noise or vibration. Machines can consequently be located in close proximity to an office or other place where noise would be objectionable.

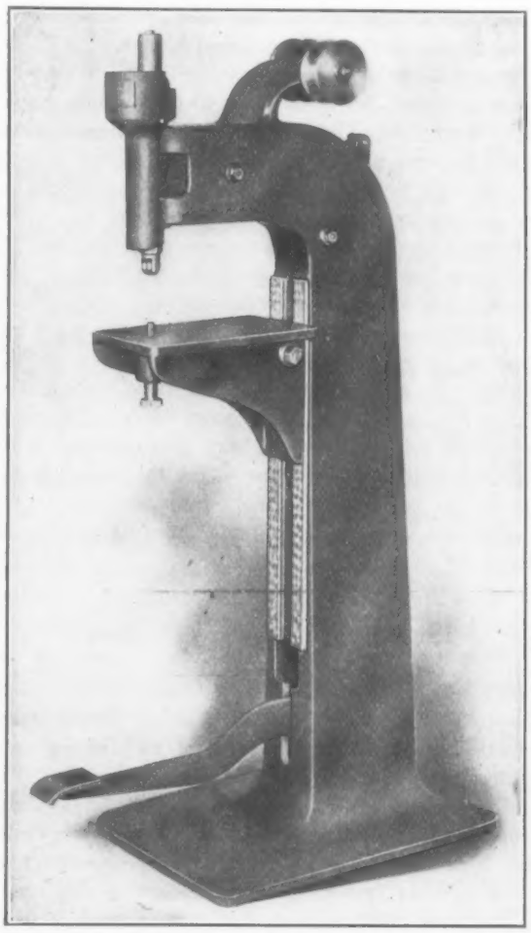


Fig. 1.—The Grant Deep Throated Rotary Rivet Spinning Machine Equipped with Flat Table.

The machine is built in three sizes, of identical dimensions, except that the diameter of the spindle pulley is, respectively, 3½, 4½ and 6 in., giving spindle speeds of 2000, 1200 and 1000 rev. per min. The capacities are 3-16, ¼ and ⅜ in. rivets. The hight from the floor to the spinning tools is 42 in. and the distance from the column to the spindle 11½ in. The table drops from the spinning tools 23 in. The hight overall is 60 in., and the table is 8 x 14 in. The spindle pulley is 3½ in. in diameter and takes a 1½-in. belt. The countershaft driving pulley is 10 in. in diameter, and the tight and loose pulleys are 6 in. in diameter by 3-in. face. The floor space required is 18 x 35 in., and the weight of the machine without countershaft is 470 lb.

The small double spindle riveting machine, Fig. 3, handles rivets of ⅛-in. diameter and less and is intended for light work, such as small hinges, jewelry novelties and similar articles. It will head simultaneously both ends of a plain wire passing through the work. The frame is so arranged that fixtures may be attached to the front face, top or back. It is planed on top between the spindles and at the front, where a small table may be fixed. The machine may be mounted on a bench or pedestal, and is operated by a treadle attached to the floor and connected underneath the machine. The maximum capacity between spindles is 1½ in. and the distance from the frame to the spindles is 2⅝ in. The table at the top is 2¾ x 3½ in. The spindles are driven at 1800 to 2000 rev. per min. by a pulley 2 in. in diameter, taking a 1-in. belt. The countershaft driving pulley is 10 in. in diameter by 2-in. face, and the tight and loose pulleys 6 in. in diameter by 2-in. face. The hight overall is 10 in., the length and width overall 21 x 7 in., the floor space 21 x 15 in. and the weight of the machine 50 lb.

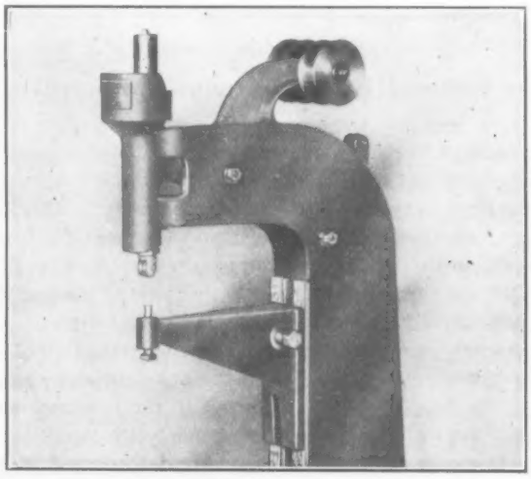


Fig. 2.—The Grant Riveting Machine with Horn Table.

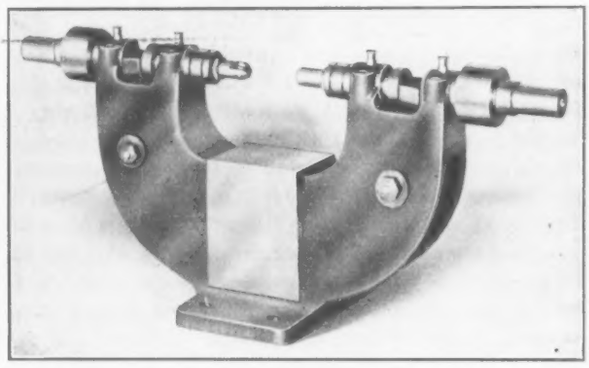


Fig. 3.—The Double-Spindle Riveting Machine Made by the Grant Mfg. & Machine Company, Bridgeport, Conn.

The Government report showing the condition of the growing corn September 1 confirms the accounts of damage from drouth and excessive heat in a great part of the corn belt in August. The indications are now for a crop of about 2,700,000,000 bushels, which is an average yield, and about the same as that of last year, but fully 400,000,000 bushels under the indications August 1. The indicated crop of spring wheat is about 280,000,000 bushels, which is 15,000,000 bushels above last year's yield. The crop of winter wheat is placed at 433,000,000 bushels, or close to last year's production. The crop of oats is 200,000,000 bushels larger than in 1908. While 1909 will not produce the bumper cereal crops promised earlier in the season, the figures set forth in this report as a whole compare favorably with those of last year.

THE IRON AGE

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The Personal Factor in Industrial Operations.

Modern business has so far eliminated the personal factor that the passing of any individual, however prominent, at the most causes but temporary unsettlement. Such comment has been widely made since Mr. Harriman's death. In his own case the unsettlement was anticipatory and was confined to that part of the financial community which measures effects by single days. And there was, on first thought, a strange contradiction of the great power he had in life in the unanimity of opinion that his death would be little felt in the country's business. Yet in this respect there was only the repetition of what was seen when other industrial leaders of the highest rank laid down their work.

It was said when the iron trade was so rapidly passing under the control of consolidations a decade ago that one of their chief weaknesses would be the suppression of personality. The close relations then existing between various individual manufacturers or officers of smaller companies and their customers, it was believed by many, would be destroyed. The great corporation might for a time do the business formerly done by its components; but at length, to some of those who had disposed of their plants and good will, the inclination to re-establish themselves would prove irresistible. The friendless corporation would find its trade deserting it at the first opportunity, and gradually the personal factor would reappear, to the confounding of all the prophets of a new era. So ran the predictions. Mr. Carnegie, himself the most munificently rewarded of all who profited by consolidation in the iron trade, freely pointed out the perils threatening a régime where there was no longer "the eye of the owner," but only, as he put it, "the eye of the salaried official."

But 10 years of eventful history have disposed of many such forebodings. It has turned out that the personal factor is not eliminated, but rather that one great element of strength in the consolidations is in aggregated personality. In only exceptional cases has there been any re-establishment of individuals as independent competitors after their original business and good will were absorbed in the large corporation. It has been found in the iron trade that if originally some individuals were in themselves large contributors to the strength of corporations in which they were merged, time has brought a counter development. In other words, the consolidations have also conferred much upon those who to-day have leadership in them. Their influence is largely an outgrowth of the influence of the corporation. Having adopted the best that was in each of their components as the standard for the whole, the consolidations represent an advance over the old régime that could not have come under any individual leadership.

The promoters of the United States Steel Corporation gave as one justification of what they brought to pass the fact that they had put the steel trade beyond the reach of an individual dominance. The danger of reprisals, as ambitious leaders entered upon new lines of production, disputing the field with those who had long occupied it, was shown to be a real one in the year before the Morgan coup. Rivalries such as have developed since 1900 in the making over of the railroad map of the United States were appearing in the steel industry. This consolidation of consolidations not only brought the contending elements together but did much to guarantee the entire trade thereafter against any conflict into which the personal element entered largely.

It is not likely that power will ever again be lodged in the hands of one man to do what has been done in very recent years toward centralizing railroad control. In the mineral and manufacturing industries, likewise, the tendency is away from control by individuals, except as they represent policies dictated by the interest of many owners. Some names are dropping out that have stood for great achievement in the building up of personal fortunes, and other names will succeed them. But rapid departures are being made from the régime of the 40 years following the Civil War. The lines of industrial development have grown more rigid and exploitation by ambitious leaders more difficult. Again the prophets of evil will prove to have been mistaken if consolidation continues to represent not the suppression of personality but its subordination to the best development of the industry and to the interests of a widely distributed ownership.

Tariff Wars Between Nations.

There is much discussion in some quarters of the possibility of "tariff wars" between the United States and other countries in the event of the application of the maximum clause of the Payne-Aldrich tariff. Since 1870 the leading nations of the world have been strongly committed to peace, and there have been no physical wars over trivial misunderstandings or imaginary affronts, such as caused the most disastrous conflicts of the centuries that preceded this recent period of peace. European experience, however, shows that nations are still prone to take offense at small cause and to engage in wars of tariffs. In 1901 Russia practically excluded American hardware from that country by a sweeping advance in tariff duties which grew out of a misunderstanding over a small cargo of Russian sugar that arrived in New York, and there have been disastrous clashes between European countries in the past 25 years.

The first notable tariff war in Europe began in 1888 between France and Italy and was not finally settled until 1899. It was brought on by an effort of the Italian Government to obtain a more favorable commercial treaty with France. The consolidation of the various kingdoms and provinces of Italy, which had formerly maintained tariffs against each other, into one united country had encouraged a rapid growth of Italian industries and commerce, especially between Italy and foreign countries. France supplied during this period about a third of the imports into Italy, and the Italian Government sought to obtain more favorable markets in

France for the products of Italy. To this end the commercial treaty between the two countries was terminated December 31, 1887. A new treaty was negotiated meantime by the two governments and was ratified by the Italian Parliament, but failed of ratification in the French Chamber. Each country then enacted a war tariff, and the hostilities extended to shipping regulations. There were disastrous losses in the trade between the two countries. Exports of iron products from France to Italy fell to about one-third of their former value, with corresponding losses in other branches of trade, while the export of Italian wines to France declined to 10 per cent. of its former volume. As a result of continuous negotiations between the two governments the various war duties and provisions were abolished early in 1890, but each country continued to apply its maximum or general tariff duties to products of the other until 1899, when a treaty became effective which substituted the minimum rates on each side with a few reservations. It was found, however, that the recovery in trade was very slow between the two countries after complete peace had been restored.

The clash between Russia and Germany in 1893-4 was of relatively short duration, lasting from August, 1893, to March, 1904, and as this period included the winter months, when many branches of trade between the two countries are inactive, it did not interrupt the mutual connections of their business houses. The trouble was an inevitable collision between the tariff policies of the two countries, and it is surprising, on the whole, that it did not lead to an armed conflict. Russia, in the period from 1868 to 1876, had a low tariff which averaged only 12 per cent. on her imports, but had gradually raised her duties to an average of 34 per cent. in 1891. The purpose of this advance was to encourage and protect manufacturing industries in Russia, especially those of iron and steel. Germany, on the other hand, had a low tariff in the '70s; but Bismarck, to secure approval for his scheme of a protective tariff, found it necessary to impose high duties on agricultural produce. In deference to commercial interests which opposed this policy Germany in 1891 adopted the plan of reducing her tariff by treaties or conventions in favor of countries that would grant reciprocal reductions on German manufactured products. Treaties along this line were negotiated with every important country except Russia, which refused to grant Germany's demands for a larger market for German manufactures. The German tariff treaty arrangement with other agricultural countries practically excluded Russian farm products, and Russia retaliated with a special advance of 50 per cent. in her tariff against Germany. This was followed in Germany by a special tariff against Russia, and the war went on until the two governments agreed upon a treaty.

A conflict between France and Switzerland, lasting from early in 1893 to the middle of 1895, grew out of the maximum and minimum tariff law which became effective in France in 1892. France had negotiated treaties or conventions with all the principal countries of Europe, in which they were accorded the minimum rates in her tariff, and a similar treaty was prepared with Switzerland, but was not approved by the French parliament. This was resented by the Swiss, who imposed war duties estimated to have been 190 per cent. higher than those previously collected on French goods. There was a heavy drop in trade between the two countries while these tariff hostilities continued, but the matter was finally adjusted after a contest of two and a half years.

It is evident that the administration at Washington will have a delicate diplomatic problem to solve if it endeavors to obtain from European countries the concessions which exporting interests have been led to expect through the operation of the maximum clause of the new tariff. European countries take vastly more interest in the problem of foreign trade than American statesmen have ever shown. It is a question of more immediate importance to them, because none of them possesses the home market that we have to absorb our attention in the United States. For nearly 20 years their tariffs have been adjusted on a bargaining, give and take, basis, like all diplomatic intercourse. The duties on their wines, silks and other imported products have been increased considerably in the regular schedules of the Payne tariff, and they may be quick to resent as undiplomatic coercion any prospect of facing still higher maximum duties.

Will Foreign Machine Tools Invade America?

The question whether a demand for machinery exceeding the supply of the domestic market will result in the importation of foreign machine tools is already under discussion. In the past there has been little disposition on the part of buyers to seek this class of equipment abroad, with the exception of certain machines largely special in their nature, which either are not built in this country or in which foreign makers are considered to excel. When last the market was stripped of all tools for early shipment, and when even inferior second-hand machinery was selling at a premium, importations increased but little. To-day it is debated whether the reduced import duty, now 30 instead of 45 per cent., will not combine with improved design and quality in the European product, which has been wrought in the past few years, to give it a foothold. This could not be accomplished except under the stress of an emergency, in which manufacturers must either go abroad for equipment with which to take care of the wants of their customers or else go without.

Such a movement seems to depend largely upon the confidence which has been or can be developed in foreign built tools. As a rule, they are now held in small regard in the United States. Had it been otherwise in 1907, when domestic machinery had been completely absorbed, there would have been a ready market for everything that the builders of Great Britain and the Continent could spare. It is a difficult task to overcome prejudice, and doubtless this will stand in the way of any very extensive importation. The builders over the water would be glad of the chance to make even a small beginning here. Business is not improving with them in the same degree as in the United States, and they could probably afford to send machinery here at low figures. The difference in duty is considerable under the new tariff. On a $500 machine, for example, the reduction is from $225 to $150. Price, however, would not be an important factor. Deliveries will be the chief element of the market, just as they were three years ago. But, as has been stated, the American buyers must first be convinced that the tools are suitable for the purposes to which they would be put. Concerning this, there is a wide difference of opinion.

European builders have made important improvement in the quality of their metal working machinery in recent years. Americans have found their competition abroad much more difficult to meet than it used to be, especially with the standard types, such as lathes, drills and planers. With the newer classes, including the automatic turret machines and some of the grinders,

the United States still holds a commanding position where high grade equipment is purchased, as is evidenced in the best of the foreign works. But some very fine tools included in this classification are now built abroad, under modern shop methods, and a few machines have been developed to a greater degree than in this country, usually in following out some line of practice inaugurated by foreign designers. American engineers have not yet given these the attention that should result later on in achieving the same leading position now occupied in other branches of machine tool design. One American dealer in advocating the complete abolishment of the tariff on machine tools argued that to do so would introduce various machines whose presence would create a demand on the part of American users and thus act as a powerful stimulus. The response, he claimed, would be instantaneous and successful. This has already been accomplished in a small way.

It is not at all impossible that some tools will be sought from other countries in the next year or two. Certain sizes of gear cutters and milling machines, which are used largely by the automobile manufacturers, are practically out of the market even now. No effort on the part of their builders, even should they strive to their utmost to increase production, could supply the wants of their customers when business has been speeded up to its limit. Conditions in other lines are almost as threatening. No harm should result from the mild invasion made possible by the exigencies of extreme prosperity. Rather should it work out as a distinct benefit to the trade.

Recovery in the Foundry Trade.

Among machinery founders the report is still that while the demand for molders is now greater than it has been in the past two years, the situation is far from bearing any resemblance to that of 1906 and 1907. The quarter ending with June showed a slight increase in the working forces in such foundries over the number reported for the first quarter of this year. It is expected that the statistics soon to be gathered for the quarter ending in September will represent a still greater increase. The occasional waves of buying in the foundry iron trade, such as that which has been seen in recent weeks, give the impression of a marked improvement in the business of the large melters of such iron. What is really signified is that the requirements of these foundries for the remainder of this year and the early months of 1910 are being covered, the movement being in part, at least, in sympathy with that in steel making iron due to the heavy demands upon the steel companies.

As appeared from our blast furnace statistics of last week, the recovery on the merchant side of pig iron production has been quite slow compared with that on the steel side. While the steel company furnaces produced 40 per cent. more pig iron in August than in January of this year, the merchant furnace companies produced about 4 per cent. less. And at that the merchant furnace output included a considerable percentage of steel making iron. In spite of the reduction in stocks of foundry pig iron the consumption of such irons bears no relation to the prosperity rate suggested by the tremendous activity in the steel trade. The facts in this connection must enter into any discriminating estimate of present conditions.

Boiler shops and foundries are finding a new and very profitable line of work in the construction of penstocks, feed pipes, casings, discharge flanges, valves, gates, swivels, reinforcing plates and angles, welded and riveted parts, tanks for oil pressure regulating systems, relays, &c., for hydraulic power plants. These were formerly turned out almost entirely from standard designs and carried in stock by concerns making a specialty of them, but increasing sizes and pressures are compelling construction engineers to have such parts built to order, and they are placing orders quite largely with local shops in which the work can be done directly under their supervision. In this way, it is felt, the special conditions obtaining for each installation can be better conformed to than by ordering in accordance with standard specifications or from catalogues.

Lake Iron Ore Shipments in August.

The detailed statement of Lake Superior iron ore shipments by ports in August, of which the total was given last week with comparisons, will be of interest. It is to be noticed that the Mesaba range did much to make August a record month in the lake ore trade, Duluth contributing over 37 per cent. of the total, as against 31.7 per cent. in August, 1908, and Superior 15.43 per cent., against 12.87 per cent. The figures represent gross tons:

	August, 1909.	August, 1908.	To Sept. 1, 1909.	To Sept. 1, 1908.
Escanaba	1,037,341	397,220	3,053,845	1,351,513
Marquette	542,607	279,610	1,413,568	625,399
Ashland	639,581	444,246	1,700,769	1,037,185
Superior	1,110,213	611,321	3,686,323	1,723,208
Duluth	2,279,242	1,764,053	7,713,377	4,583,987
Two Harbors	1,584,215	1,053,205	5,020,667	2,663,644
Totals	7,193,199	4,749,655	22,588,549	11,984,936

The July total was 6,693,025 tons. Thus August, without any strain upon the shipping or handling facilities of the lakes, exceeded the preceding month by 500,000 tons. It would appear that the ore fleet and the ore docks of the lakes, with the receiving facilities at Lake Erie and Lake Michigan ports, could even now bring down 50,000,000 tons of ore in a season.

A Marine Steam Turbine Reducing Gear.

It is fundamental that any motor running at slow speed must be larger than one of equivalent power running at a higher speed. Steam turbines are naturally adapted to run at very high speeds, and many forms of apparatus, such as generators, pumps, blowers, &c., intended to be directly connected to steam turbines, have been brought out in special forms capable of operation at high speeds. The propulsion of vessels by steam turbines has been a problem not so easily solved, as there is a limit to the speed of the screws. Consequently where turbines have been applied to vessels it has been necessary to make them larger than was desirable simply that they might have slow enough rotative speeds to be directly connected to the screws. Attacking this problem from another standpoint, Rear Admiral George W. Melville, U. S. N., retired; J. H. McAlpine, formerly of the navy, and George Westinghouse have been working together upon a reducing gear to be interposed between a marine turbine and the screw to make it possible to use smaller turbines running at higher speeds.

The first model of this reducing gear has recently been completed at the shops of the Westinghouse Machine Company at East Pittsburgh, Pa. The details of its construction have not yet been announced, but it is claimed that with the use of this reducing gear it will be possible to use turbines of lighter weight than were formerly placed in vessels, and it is understood that it will make it possible not only to greatly reduce the weight of the power plant in very large transatlantic steamships and battleships, but also to very materially decrease the expense of their construction.

Canada's Naval Plans and Shipbuilding Prospects.

TORONTO, September 10, 1909.—Events in relation to Canadian shipbuilding enterprise are taking the course foreshadowed in this correspondence at the time of the adoption by the House of Commons of the resolution on Canadian naval defence policy. It will be recalled that the resolution was a declaration in favor of the undertaking by Canada of a part of the responsibility for the protection of its own coasts and of its floating commerce. Included in it was an expression of the country's readiness to do its part for the strengthening of the sea power of the British Empire as a whole, but with this reservation, that everything done in respect thereto should be within the limits of the Dominion's autonomy. A short time after the sense of the House of Commons had been thus recorded the British Government issued invitations to the governments of the several dominions of the empire to send delegates to a special imperial conference in London to discuss matters of common interest. That conference was duly held, and the general conclusions reached have now been made known. The Canadian delegates adhered to the spirit of the House of Commons resolution—that is, while cordially acquiescing in the principle that the outlying parts of the empire should bear a portion of the burden of naval defence, Canada should perform its part as a practically independent State. Hence, instead of Canada contributing a Dreadnought or a money grant at intervals to the British navy, it was postulated that Canadian naval strength should be developed and kept under Canadian control, the understanding being that the country's resources of sea power should be ready for service as auxiliaries of the royal navy in whatever struggles the Canadian people desired them to take part.

As was pointed out in this correspondence, this departure along a new line of public policy opened new prospects for Canadian shipbuilding. It was reasonably assured that a popular assembly holding the two ideas, first, that the country should participate in the responsibility for the naval defence of the empire, and second, that the self-governing power of the Dominion should nevertheless be kept inviolate, would favor the building in Canadian yards of such war craft as might be added to the country's fighting strength. The first reports of the outcome of the conference were at variance with this view, as it was therein stated that the initial vessels for Canada would be built in the United Kingdom. Two third-class cruisers would, it was said, be loaned to the Dominion by the British Government. These vessels, it was added, would be refitted and altered in British yards at the expense of the Canadian Government. New cruisers, submarines, torpedo boats and other smaller craft would, it was confidently stated, be built in Great Britain on the order of the Canadian Government. The Canadian Associated Press now states on what is given as the highest authority—presumably the word of one of the two Canadian Ministers who attended the conference in London—that the vessels will be built in Canada. The Canadian Associated Press learns in addition that a representative of a leading firm of British shipbuilders will soon arrive in this country to select a site for a shipyard. Vancouver is named as the point on the Pacific at which yards will probably be established. Ralph Smith, who represents Nanaimo, British Columbia, in the House of Commons, came to Ottawa a few days ago to use his influence with the Government to aid the construction of docks on the Pacific. As Mr. Smith is a warm supporter of the Government, he has probably good reason to expect to succeed in his mission. In a published interview he expressed his belief that two or three cruisers will be built in British Columbia. The emphasizing of the Pacific aspect in the imperial defence scheme agreed upon at the conference lends probability to this view, as both Australia and New Zealand, as well as Canada, showed a desire to have their naval protection materially increased. C. A. C. J.

The T. H. Symington Company, Baltimore, Md., manufacturer of Symington journal boxes and lids and Baltimore ball bearings, has opened a permanent office at 1912 Hudson Terminal Building, 30 Church street, New York City, with T. C. de Rosset in charge.

The Gayley Dry Blast in Great Britain.

As substantiating the claims made by James Gayley in his original publication on the dry air blast, that the economical results were not peculiar to furnaces working under the atmospheric conditions of the United States, the London *Iron and Coal Trades Review* gives some details of experience at the Cardiff, Wales, furnaces of Guest, Keen & Nettlefolds. In addition to the Cardiff data, a comparison is given with the Isabella furnace results and comment is made as given below:

Dry Air Blast at the Cardiff Furnaces of Guest, Keen & Nettlefolds.

	Weekly product. Tons.	Coke per ton of iron. Pounds.
Average of first 50 weeks of blast, on natural air.	2,001	2,278
With dry air blast and operated for increase in output (average of five weeks)	2,530	1,972
With dry air blast, and operated for economy of fuel (average of four weeks)	2,286	1,857
Advantage of dry air for—		Per cent.
Increase in output		26.4
Decrease in coke		13.4
Advantage of dry air for decrease in coke consumption—		
Increase in output		14.1
Decrease in coke		18.4

To what extent these records confirm the figures given by Mr. Gayley in his original papers will be seen in the following statement:

Comparison of Results Obtained at the Isabella and Cardiff Furnaces with Natural and Dry Air Blast.

	Coke consumption per ton of iron. Nat. air. Lb.	Dry air. Lb.	Decrease in coke consumption per ton of iron. Lb.	%	Output of pig iron per week. Nat. air. Tons.	Dry air. Tons.	Increase in output per week. Tons.	%
Isabella	2,278	1,821	457	20.0	2,800	3,024	224	8.0
Cardiff	2,278	1,857	421	18.4	2,001	2,286	285	14.1

In the records of the Isabella, Warwick and Cardiff furnaces we have conclusive proof that the effect of the dry air process on the coke consumption and output of pig iron is not confined to one particular furnace, nor to furnaces situated in one particular region. The process has established its power for reducing coke consumption and increasing output. The question then arises, Is the reduction in coke consumption sufficient to justify the capital and working costs of the process? On this point we have the evidence of Mr. Cook that his plant [Warwick] yields an ample return on the capital expenditure, and we also have the statement of Bruce Walter [Pittsburgh] that the working costs are not more than one-tenth of the saving effected.

Careful estimates of the capital and working costs of dry air installations show that the savings effected by the process will not only meet depreciation charges and working costs, but will yield an ample profit. The development of the process is perhaps the best evidence of its economical value. It has now been adopted at the following furnaces:

	Cubic feet of air per minute.
Isabella furnaces	40,000
Warwick furnaces	70,000
E. & G. Brooke Company	20,000
Cardiff furnaces	70,000
South Works, Illinois	122,000
Northwestern Iron Company, Milwaukee	46,600
Toledo Furnace Company	81,000
Cleveland Cliffs Iron Company	10,000

In addition to these, it is stated by Bruce Walter that several large installations having a total capacity of 1,000,000 cu. ft. of air per minute are under consideration. One of the large German iron producing firms is installing a plant of 52,000 cu. ft. per minute capacity, and a firm in the Midlands has contracted for an extensive installation. By the failure of Mr. Gayley to obtain an extension of his patents [in Great Britain] the process is not hampered even in a small measure by patent rights.

Coke Production in 1908.

A report by E. W. Parker of the United States Geological Survey on the manufacture of coke in 1908 is now in press as an advance chapter from "Mineral Resources of the United States, Calendar Year 1908." According to this report, the combined production of beehive and retort oven coke in the United States in 1908 amounted to 26,033,518 net tons, valued at $62,483,983, against 40,779,564 net tons, valued at $111,539,126, in 1907. In the earlier year the production exceeded all previous records in the history of coke making in the United States; the average price per ton in that year was also the highest ever recorded. Compared with 1907 the production in 1908 shows a decrease of 14,746,046 net tons, or 36.14 per cent., in quantity, and of $49,055,143, or 43.98 per cent., in value. The average price per ton at the ovens declined from $2.74 to $2.40. Of the total 1908 output 21,832,292 tons, or 83.86 per cent., was produced in behive ovens and 4,201,226 tons, or 16.14 per cent., in retort ovens. The decrease in beehive coke from 1907 was 13,339,373 net tons, or 37.93 per cent., and in by-product coke 1,406,673 tons, or 25.08 per cent.

The quantity of coal consumed in the manufacture of coke in 1908 was 39,440,837 net tons, valued at $45,222,474. The value of the coke produced from this coal was $62,483,983, a difference of $17,261,509, which, less the cost of manufacture and the expense of administration, &c., represents the profit on the coking operations. In 1907 the value of the coal used was $72,784,851, and the value of the coke produced from this $111,539,126, a difference of $38,754,275.

Notwithstanding the decrease in production in 1908 as compared with 1907 there was an increase in the number of ovens from 99,680 to 101,218. Of the total number of ovens 12,920 were idle throughout the year 1908, though many more were out of blast for a good portion of the time. In 1907, out of a total of 99,680 ovens 4934 were idle during the year. The average production of the active ovens was 294.8 net tons in 1908, as against 430.4 tons per oven in 1907. The average production for each beehive oven for the last four years has been 365.8 tons in 1905, 373.6 tons in 1906, 386.8 tons in 1907, and 258 tons in 1908. The average production for the retort ovens in the same years was, respectively, 1158.8, 1356, 1472 and 1142 tons. In 1905 the average production from by-product ovens was a little more than three times that from beehive ovens, and in 1908 it was nearly six times.

Coke Making in By-Product Ovens.

The year 1908 was not marked by any notable gain in the construction of by-product coking plants, though some new work was done. There was a net increase of 115 in the number of completed ovens in 1908 over 1907, the totals for the two years being, respectively, 3892 and 4007. The additional equipment consisted of 140 Koppers regenerative ovens built at Joliet, Ill., by the United States Steel Corporation, but this increase was partly offset by the dismantling of 25 Semet-Solvay ovens at Sharon, Pa., the net gain being 115 ovens. Included in the total of 4007 completed ovens in 1908 are 152 Newton-Chambers ovens at Vintondale, Pa., but as no recovery of by-products was made at this plant in 1908 the production of coke is included with that from beehive ovens. The 56 ovens of the same type at Pocahontas, Va., have not been in practical operation since they were first installed. In addition to these there was one other by-product plant of 120 ovens that was not operated during the year. The number of retort ovens producing coke in 1908 was 3679, as compared with 3811 active ovens in 1907.

The construction work on plants that were not completed at the end of 1908 consisted of 140 additional Koppers ovens at Joliet, Ill., 50 United Otto ovens at Kokotto, near Cincinnati, doubling the plant at that place, and 50 United Otto ovens at Indianapolis, Ind. The last mentioned are the first by-product ovens to be constructed in Indiana and they will probably use West Virginia coal.

The Union Mining Company, Baltimore, Md., proprietor of the Mount Savage Firebrick Works, has just secured an order from one of the largest iron and steel companies in the East for firebrick linings for five 20 x 80 ft. stoves, making the second order of this kind it has recently booked. These orders are due to the exceptional service being obtained from Mount Savage furnace linings.

A New Product of the Erie City Iron Works.

The Erie City Iron Works, Erie, Pa., has acquired the American rights for the Lentz compound poppet valve steam engine, a type which has been built and operated abroad for the last few years. The engine is principally remarkable for its simplicity. It has a girder type frame, with the low pressure cylinder bolted to the frame and the high pressure cylinder secured to it by a distance piece. Its supporting feet are free to slide with expansion and contraction. The piston body is turned slightly eccentric, so as to obtain a large bearing surface on the bottom of the cylinder. There is no elastic packing throughout the engine. In the stuffing box is a series of cast iron ground rings, which do not touch the piston rod, and between them are floating rings which fit the piston rod within 1-1000 in. Oil can be kept circulating in the stuffing box if necessary, but water, the result of condensation, is generally sufficient. All the joints in the engine are metal to metal, tightness being secured by grinding and scraping.

Particularly of interest is the valve gear. The admission valve is a double seated poppet valve, and there are no stuffing boxes on the valve spindles, which are ground to fit the long bushes surrounding them. Grooves in the spindles serve to prevent leakage. No dash pots are used. The valve is moved by a cam acting on a roller and when seated is not in contact with the roller, although the clearance is extremely small. The roller is never clear of the cam until the valve is seated and consequently the engine makes no noise when running up to even 200 rev. per min. The drive of the lay shaft is also peculiar. Instead of a bevel gear drive a friction cone drive is used. The cones are pressed hard together, so that the drive is substantially by friction, but to prevent slipping very shallow teeth are provided, the points of which are turned off. The eccentrics on this shaft operate the valves. The rods of these eccentrics are coupled directly to the ends of the cam levers. Governing is effected by varying the throw of the eccentrics by means of a wedge which slides in the shaft and the eccentrics. The governor is also novel. It is of a centrifugal type, with its axis horizontal, and its action is to shift the wedge to alter the throw of the eccentrics. The governor is exceedingly sensitive. To permanently change the speed the tension of the governor spring is altered by means of a hand wheel.

An engine of this type built by Davey, Paxman & Co., Ltd., Colchester, England, the English licensees of the Lentz engine, in a test with saturated steam at a boiler pressure of 170 lb., with a vacuum of 26 in., gave an indicated horsepower of 366, with a steam consumption per indicated horsepower of 12.3 lb. With superheated steam at 150 degrees F and the same boiler pressure and vacuum, the indicated horsepower was also the same, but the steam per indicated horsepower was 10.4 lb. These results were obtained from a new engine within two days of its first running. It ran easily at an overload of 33 1-3 per cent. The Erie City Iron Works has already received orders for six of these engines. One, now in successful operation, is in the plant of the Hammermill Paper Company, Erie, Pa., and is reported to be doing quite wonderful work.

The gross business of the Westinghouse Electric & Mfg. Company in August was larger than the total for August, 1906, when nearly all departments were running full and the company was paying 10 per cent. dividends on all its stock.

The National Founders' Association will submit to a vote of its membership the selection of the place for its annual convention in November. The choice is between New York and Chicago. Last year the vote was strongly in favor of New York.

PERSONAL.

Samuel H. Dougherty, for many years St. Louis sales manager of the Joseph Dixon Crucible Company, has severed that connection and is now associated with the Jonathan Bartley Crucible Company, Trenton, N. J., as its Western representative.

H. F. Martin, general manager of sales of the Pennsylvania Steel Company, is taking a trip to the Pacific Coast.

Robert Bentley, president of the Ohio Iron & Steel Company, operating Mary Furnace at Lowellville, Ohio, has returned from a stay of several months in Europe.

August Marx of the G. A. Gray Company, Cincinnati, has returned from a four months' trip to Europe and northern Africa.

W. H. Harrison, who has been connected with some of the largest machinery houses in New York, and who has been well known in the trade for a long time, has been appointed by the State Board of Taxes to reappraise machinery and supplies for the State of New Jersey, the appraisal to cover the machinery and supplies of all railroad shops in New Jersey. Mr. Harrison is especially fitted for this work because of his wide experience in the machinery business and his intimate knowledge of shop equipment.

Charles F. Rand, president of the Spanish-American Iron Company, has sailed for Europe.

Eli Joseph, president of the Joseph Joseph & Bros. Company, arrived in New York from a European trip Sept. 10.

B. F. Jones, president of the Jones & Laughlin Steel Company, Pittsburgh, has sailed for Europe.

The Franklin Institute, Philadelphia, announced that its programme for the stated meeting on the evening of September 15 would include illustrated lectures by John Birkinbine on "Mexico, Its People and Industries," and by his son, Henry E. Birkinbine, on "A Trail Through the Mountains of Southern Mexico." Both speakers have recently returned from a visit to Mexico.

Henry F. Lyon has been placed in charge of the Seattle branch of the United Iron Works, Spokane, Wash.

E. N. Dickson has resigned as vice-president of the Milwaukee Coke Company to engage in manufacturing on his own account.

H. S. Budd of the D'Olier Engineering Company has resigned to enter the employ of the Allis-Chalmers Company with office at Pittsburgh.

V. Ysasi, Philadelphia representative of the Spanish ore firm of Sota & Aznar, Arcade Building, Philadelphia, who has been in Europe for some time, returns this month. J. W. Pickering of the London office of the company has been in charge of the Philadelphia office in Mr. Ysasi's absence.

Walter M. Nones, who has represented a number of manufacturers of machinery specialties in London in recent years, and who has been in the United States for nine months, with headquarters at 27-29 Water street, New York, expects to return to London in October to resume the representation abroad of American-made articles.

Franz Schmacks, manager of the Aktien Gesellschaft fuer Kohlendestillation Gelsenkirchen of Duesseldorf, and Dr. J. A. Roelofsen, manager of the Coal Distillation Company of Middlesbrough, have arrived in this country. They represent the Huessener and Collin by-product coke ovens.

Leonard Peckitt, president of the Empire Steel & Iron Company, Catasauqua, Pa., has returned from a visit to his native place, Thirsk, in Yorkshire, England.

Benjamin Nicoll, of B. Nicoll & Co., New York, arrived Wednesday on the steam yacht Varuna from Cherbourg.

W. E. Corey, president of the United States Steel Corporation, who has been confined to his home as the result of an accident, is again at his desk.

Dr. P. Heroult, the inventor of the electrical steel process bearing his name, has returned from France and is now at Chicago.

Herman Riecke of the Vienna office of Schuchardt & Schutte, is making an extensive trip throughout the United States visiting manufacturers whom his firm represents abroad.

Alfred Hilger of Remscheid, Germany, who is works manager for Wiebush & Hilger, Ltd., is spending two months in this country on business.

Charles S. Belsterling, traffic manager of the American Bridge Company at Pittsburgh, has been elected president of the Traffic Club of that city, succeeding W. Owen Davis.

W. A. Thomas, president of the Thomas Steel Company, Niles, Ohio, has returned from Europe.

Nathan A. Taylor of the N. & G. Taylor Company, manufacturer of tin plate, Philadelphia, has returned from abroad.

OBITUARY.

CARL MENSHAUSEN, a member of the Board of Directors of Fried Krupp A. G. of Esen, Germany, died at Duesseldorf July 21. He joined the organization in 1877, and was chiefly instrumental in negotiations for war material.

ISAAC HULME, president of the Vulcan Iron Works, San Francisco, died August 31, after undergoing a surgical operation.

The Pittsburgh Foundrymen's Association.

After a lapse of two months the Pittsburgh Foundrymen's Association resumed its regular monthly meetings by assembling at the Fort Pitt Hotel, Pittsburgh, on the evening of September 13, where a dinner, in which 41 participated, preceded the business session. The meeting was called to order by President Joseph T. Speer. Some routine proceedings followed. The Membership Committee had previously approved the names of five applicants and they were elected at this meeting. This committee has done creditable work and its determination to bring in more new members will surely result in gratifying growth of the association.

President Speer introduced Dr. Joseph A. Holmes, expert in charge of the Arsenal Testing Station, Pittsburgh, part of the Technological Branch of the United States Geological Survey, who happened to be present unexpectedly at the meeting, and who made brief reference to the work his department is carrying on at the station. The phases covered were the testing of coal and coke and structural material, including building, engineering and construction work, and the subject of mine explosions. Congressman James Francis Burke, who had been scheduled to address the association on "The New Tariff and Its Effect on Foundry Material," spoke extemporaneously and eloquently on the importance of the upbuilding of a merchant marine and the possibilities in the Far East and South American republics for marketing a much larger part of the products made in the United States, and of the exceptional advantages that might be had by devoting more time to foreign business and the good which would result from American manufacturers taking a greater interest in the development of foreign trade. Both speakers were given a vote of thanks for their interesting addresses.

After the meeting adjourned the Executive Committee held a short session. The next meeting of the association will take place on the evening of October 4, at the Carnegie Technical Schools, Pittsburgh, and the subject of "Permanent Molds" will be taken up by Edgar A. Custer, president of the Tacony Iron Company. The process of making complicated castings by this method will be interestingly presented by an exhibition of moving pictures, showing molds in the actual operation of pouring.

Trade Publications.

Engines.—American Diesel Engine Company, Adolphus Busch, 11 Broadway, New York. Catalogue. Describes an oil engine invented by Rudolph Diesel of Germany. It is a vertical inclosed type four-cycle engine differing from other internal combustion engines in that it compresses a full charge of air to a point above the igniting point of the fuel, then injects this fuel for a certain period into hot air, where it burns with limits of pressure and temperature under perfect control.

Waste-Heat Air Heater.—Green Fuel Eocnomizer Company, Matteawan, N. Y. Bulletin No. 123. Describes the Green patent waste-heat air heater, an economizer utilizing the waste heat in chimney flue gases for heating air to be used for drying purposes or for heating buildings. It is pointed out that as compared with the use of live steam for heating air the Green process is more direct, the waste heat air heater performing the function of both boiler and heating coils.

Electrical Equipment.—General Electric Company, Schenectady, N. Y. Bulletins and booklets. Bulletin No. 4665 shows electrical equipment for operating pulp and paper mills and particularly describes the application of the electric motor to the paper industry. No. 4680 refers to tungsten lamps and particularly their use in sign lighting. No. 4688 describes a new meter board made of molded material designed to replace the customary wooden board used in mounting meters. Booklet No. 3839 is devoted to fan motors and booklet No. 3850 deals with the application of tungsten lamps.

Tool Steels.—Jno. Hy. Andrew & Co., Sheffield, England, and 107 West street, New York. Booklet. Gives a description of the methods of manufacturing Toledo high speed steel and directions for its use, with advice as to what brand to order for certain purposes. Some tables are included and references made to a special brand of mining drill steel.

High Speed Forging Presses.—United Engineering & Foundry Company, Pittsburgh, Pa. Catalogue, 8 x 10¾ in. A four-column type single cylinder high speed steam hydraulic forging process which is made up to 2000 tons capacity is illustrated, and a general description of the machine is included. A number of different types of hydraulic presses of large capacity are shown and a list of the company's other machinery products are given.

Rock Drills.—Ingersoll-Rand Company, 11 Braodway, New York. Bulletin No. 4009. Electric air drills are shown in operation on tunnel work and in mines and quarries in various parts of the world, and the operation of the Ingersoll-Temple electric air rock drill is described.

Electric Tools.—Cincinnati Electrical Tool Company, Cincinnati, Ohio. Catalogue, 6 x 9 in., 43 pages. Portable electric chipping hammers and portable electric drills are treated of, and an air-cooled two-spindle drill operated in connection with an old-man stand is shown. Portable bench grinders, buffers and grinders and other electrical equipment are also shown.

Copying Presses and Office Supplies.—Samuel C. Tatum Company, Cincinnati, Ohio. Booklet. This publication was issued in celebration of the fiftieth anniversary of the company, and contains pictures of the company's plants and the heads of departments, together with a history of the business. The company's products are copying presses and accessories, loose-leaf binders, paper punches, ink stands, paper weights, wire baskets and miscellaneous other office supplies.

Pumps.—Mast, Foos & Co., Springfield, Ohio. Catalogue No. 37, 4 x 6½ in., 128 pages. Describes a very complete line of force and lift pumps, including some special pumping equipment in the way of pumps designed for use in drawing water from shallow wells and special pumps for deep wells. Windmill pumps are shown, together with underground force pumps, &c. Some useful information, such as methods of determining the amount of water delivered per minute, &c., is included.

Wire Working Machinery.—F. B. Shuster & Co., New Haven, Conn. Catalogue, 6 x 9 in., 70 pages. Automatic wire straightening and cutting machines are illustrated and their working parts are described. Hand wire cutters, combined hand and power wire straightening and cutting machines are shown and directions are given for operating them. Rotary-blow riveting machines are also shown, and it is explained that the company manufactures special machinery for wire forming, multiple spindle drilling machines, &c.

Machine Tools.—W. F. & John Barnes Company, Rockford, Ill. Catalogue No. 69. Chiefly devoted to the line of upright and horizontal radial drills made by this company. All of the latest improvements which have been made in the various styles of these tools are noted. An improved water emery grinder arranged both for belt and independent motor drive is shown, also an adjustable screw press designed for use in machine shops for pressing shafts into pulleys, gears, hubs, &c. The company makes in addition to the machines described in this catalogue a complete line of screw cutting lathes from 9 in. to 13 in. swing, also a complete line of hand and foot power woodworking machines for use of carpenters, builders, &c.

Antifriction Metal.—Pittsburgh White Metal Company, Pittsburgh and New York City. Hanger referring to armature antifriction metal, which is a specialty of this company.

Rock Drills.—Ingersoll-Rand Company, 11 Broadway, New York. Publication No. 4004. Describes the Arc Valve tappet rock drill, the valve movement of which, it is claimed, renders it peculiarly useful when steam is used and when water or condensation is likely to be encountered. Several views of the drill in use in mines and quarries are given and some space is devoted to the Sergeant drill chuck and drill shell, while a page is used to illustrate duplicate parts for all sizes of standard drills.

Asbestos Protected Metal.—Asbestos Protected Metal Company, Canton, Mass. Catalogue, 6 x 9 in., 32 pages. Many illustrations showing asbestos protected metal made by the company in use on industrial buildings, residences, &c., are given. This metal is composed of a sheet of steel with a coating of a special asphalt compound, applied at a temperature of 600 degrees F., with a layer of asbestos felt applied on both sides of the sheet and firmly imbedded in the compound, presenting a surface which is water, acid and fire proof. It is made in various forms, flat, corrugated, beaded, &c., and is finished in different colors, or for interior work may be grained to imitate wood.

Automobile and Gas Engine Lubricants.—Acheson Oildag Company, Niagara Falls, N. Y. Two booklets. One describes the use of Oildag, which is a mixture of graphite and oil, for gas engines, and contains testimonials from users, while the other booklet gives reports of Prof. Charles F. Mabery and committees of the Automobile Club of America on the merits of Oildag as an automobile lubricant.

Ore, Coke and Pig Iron.—Shenango Furnace Company, Pittsburgh, Pa. Booklet. Contains views of the company's lines and transportation steamers and furnaces, and gives analyses of its ores.

Dynamos and Motors.—Garwood Electric Company, Garwood, N. J. Bulletin No. 500 G. This company has succeeded to the rights to manufacture dynamos, motors and other appliances formerly made by the C. & C. Electric Company of Garwood. The bulletin contains views of the company's plant, together with some views of standard generators and motors, their parts, and several typical installations.

Aerial Tramways.—Trenton Iron Company, Trenton, N. J. Catalogue, 6 x 8, 63 pages. The Bleichert system of aerial tramways, whereby material is carried in receptacles which move in a continuous circuit at definite intervals along a line of cables graduated in size to the weight it has to support and in which emptics return along a lighter line of cables parallel with the loaded line, is fully described. Motion is imparted to the carriage by a light endless wire rope. Installations of the cable system are shown and sections of the transmission ropes and carriers made for various purposes are illustrated with line drawings; testimonials as to the cost of operation and maintenance are included.

Lathes.—Champion Tool Works, Cincinnati, Ohio. Catalogue, 6 x 8½ in. Contains views of the standard types of lathes made by the company, including an 18-in. quick change gear engine lathe, an 18-in. standard engine lathe, 16-in. lathes of the same type, and a 16-in. double back gear lathe. A 14-in. standard lathe and a 12-in. quick change engine lathe are shown, with other smaller lathes and their attachments. Each page contains an illustration of a lathe with a brief description and specifications.

Power Pumps.—Lucas Pump Company, Dayton, Ohio. Folder. Shows four pumps, including a deep well working head pump, a pump designed for spraying and other purposes, a double acting triplex pump and a pump for general service. Several other standard pumps are briefly alluded to.

Industrial Ovens and Accessories.—Oven Equipment & Mfg. Company, Stamford, Conn. Catalogue, 6 x 7 in., 41 pages. Inclosed frame gas burners for heating large ovens or rooms for baking, drying and other purposes are described and ovens of various types are shown. These ovens are made for every use where baking and drying is necessary, and some special ovens for japanning under certain conditions are shown. Some space is given to air pressure gauges, thermometers, &c.

Chemical Works Equipment.—Pratt Engineering & Machine Company, Atlanta, Ga. Five bulletins. No. 101 describes a dust weighing hopper, acid phosphate mixer and an acid phosphate automatic dump car, and refers briefly to sulphuric acid machinery. An acid phosphate conveyor and a bagging machine are described in No. 102, and No. 111 treats of acid dumping apparatus, eggs, valves and fittings, blow boxes, measuring rod plugs and seats. No. 112 shows sulphuric acid appliances, such as exhausters, flue bands and hangers, and a flue damper, and No. 113 illustrates pyrites furnace fittings for sulphuric acid works.

Leather Belting.—Charles A. Schieren Company, New York. Booklet. Issued in consideration of the Hudson-Fulton celebration. Contains a history of the life of Henry Hudson and the discovery of the Hudson River and of Robert Fulton's life, together with an account of his designing and constructing of the Clermont. Incidentally it calls attention to Duxbak belting, which is one of the Charles A. Schieren Company's leather belting specialties. The booklet is attractively arranged and of timely interest.

The La Belle Iron Works.

From the annual report of the La Belle Iron Works, Steubenville, Ohio, for the fiscal year ending June 30, 1909, submitted to the stockholders at their annual meeting, held in Wheeling, W. Va., September 15, the following financial statements are taken:

INCOME ACCOUNT FOR THE YEAR ENDING JUNE 30, 1909.

Net earnings, after deducting charges for maintenance and repairs of approximately $517,000		$1,854,830.14
Less—Provision for the exhaustion of minerals, extinguishment of lease values, development, &c.		40,436.41
Profits for the year		$1,814,393.73
Deduct—		
Interest on first mortgage bonds	$143,710.00	
Cash dividends on capital stock at $8 per share	793,120.00	
		936,830.00
Surplus for the year		$877,563.73
Surplus at July 1, 1908		1,435,654.48
Total surplus		$2,313,218.21
Deduct—		
Appropriation for depreciation of capital assets		250,000.00
Net surplus		$2,063,218.21

BALANCE SHEET, AS OF JUNE 30, 1909.

Assets.

Real estate, plant, &c., at Steubenville and Wheeling: also mining and gas and oil property, equipment, &c		$11,225,911.39
Other assets		125,000.00
Total capital assets		$11,350,911.39
Cash held by trustee for redemption of matured bonds		8,000.00
Inventories of manufactured product, materials, &c., at cost	$2,746,039.78	
Accounts and bills receivable	1,166,220.60	
Cash	1,335,361.75	
Total current assets		$5,247,622.13
Unexpired insurance, &c		11,312.42
Total		$16,617,845.94

Liabilities.

Capital stock—		
Total authorized issue		$10,000,000.00
Total issued—99,154⅔ shares of $100 each		$9,915,466.67
First mortgage 6% bonds—		
Total issued	$2,500,000.00	
Less—Redeemed $92,000.00		
In treasury 44,000.00		
	136,000.00	2,364,000.00
Total capital liabilities		$12,279,466.67
Accounts payable	$417,367.54	
Wages, taxes and royalties accrued	221,203.66	
Bond interest accrued and coupons not presented for payment	17,765.00	
Cash dividend on capital stock	198,294.00	
Total current liabilities		$854,630.20
Reserves—		
For general depreciation	$1,000,000.00	
For exhaustion of minerals	219,886.48	
For relining furnaces, extraordinary repairs and contingencies	200,644.38	1,420,530.86
Surplus at June 30, 1909		2,063,218.21
Total		$16,617,845.94

From the accompanying remarks of President Isaac M. Scott the following extracts are taken:

It is gratifying to be able to report that, owing to an increase in the volume of business, the manufacturing properties (the furnace department excepted) produced during the last year a tonnage greater than during the previous year, the increase in some lines being quite marked. With this increase in volume, lower costs naturally obtained, which in a measure tended to offset the low prices at which it was necessary to market the material; the production for the year and comparison with the previous year bein gas follows: Pig Iron, 130,898 gross tons, decrease 25 per cent.; slabs and billets, 201,686 gross tons, increase 7 per cent.; plates and skelp, 165,625 gross tons, increase 13 per cent.; sheets, 36,598 gross tons, increase 315 per cent.; tubular goods, 51,532 gross tons, increase 18 per cent; nails, 187,722 kegs, increase 60 per cent.

The value of the shipments for the year aggregated $10,278,456, an increase of 15 per cent. over the previous year.

During the year the only addition made to plant equipment was a metal mixer, which was installed and put into operation early in July last. The company, of course, derived no benefit from this improvement during the fiscal year just closed, but from experience over the last two months, or since the mixer was put into operation, we feel safe in saying that not only will the quality of the company's product be improved by its use, but the cost of production will be substantially reduced as well.

During the fiscal year the Brooke County oil property produced 202,954 barrels of oil, making a total production for the field to June 30, 1909, of approximately 300,000 barrels. While the present rate of production shows a very material decrease, as compared with the output when the field was at its best, the company still derives a substantial monthly income from this source, which is likely to continue for some time to come.

During the last fiscal year the company, in common with others engaged in the same line of business, had not only to contend with a less than normal demand for its goods, but a reduction in values running all the way from $3 to $5 per ton on the raw products to $10 per ton on the finished goods as well. Fortunately, following this reduction in prices, a betterment in demand was experienced, the increase in volume during the last quarter of the fiscal year being quite marked. Prices, however, though showing some improvement over the lowest level reached, are still relatively low, but with the further increase in demand which is sure to follow the full resumption of buying on the part of the transportation companies of the country higher prices can reasonably be expected.

A still further source of disturbance experienced during the year was the general uneasiness on the part of the trade attending the revision of the tariff, which retarded a buying movement that ordinarily would have obtained during at least the last half of the fiscal year. With regard to the tariff changes, it is the belief of the management that, while the reduction made in the former rates applying on steel articles can well be regarded as excessive, the new rates should in ordinary times be fairly protective.

The Tariff Commission Appointed.

President Taft has appointed the new Tariff Commission, which is to assist him in the execution of the tariff law, with especial reference to applying the maximum and minimum clauses to nations which are unfriendly or friendly in their tariff relations with the United States. The board consists of three members, as follows: Prof. Henry C. Emery of Yale, chairman: James B. Reynolds of Massachusetts, now Assistant Secretary of the Treasury, and Alvin H. Sanders of Chicago, at present editor and proprietor of the *Breeders' Gazette*.

With the announcement of the selection of this new board, authorized by the Payne tariff bill, this statement was given out: "The President and the Secretary of the Treasury have agreed upon the plan that these three gentlemen are to constitute the board and are to be given authority to employ such special experts as may be needed in the investigation of the foreign and domestic tariff."

Prof. Henry Crosby Emery has always been regarded as a radical tariff reformer. He succeeded Arthur T. Hadley as professor of political economy when Dr. Hadley was made president of Yale University, and his classroom instruction has recommended a sweeping reduction in the tariff. He has written considerably on economics. One of his books is "Speculation on the Stock and Produce Exchanges in the United States." Mr. Sanders is a staunch supporter of reciprocity.

The A. Buch's Sons Company, Elizabethtown, Pa., has opened a sales office and demonstrating room at 999 North Marshall street Philadelphia, Pa., for the purpose of showing the Gravity molding machine, also portable jarring and squeeze machines, in operation. C. A. West and G. E. Bates will act as sales managers for the company.

NEWS OF THE WORKS.

Iron and Steel.

The recent sale of the plant of the Waynesburg Forge, Sheet & Tin Mills to local capitalists of Waynesburg, Pa., headed by I. N. Kuhn, for the sum of $22,000, has been confirmed by the courts of Greene County, Pa. It is understood that a company will be formed to operate the mill. The Waynesburg Forge, Sheet & Tin Mills suspended during the year 1907, but the plant was operated under lease by the Universal Rolling Mill Company until February, 1909.

The Bollinger-Andrews Construction Company, 409-411 Empire Building, Pittsburgh, shops at Verona, Pa., is running its ingot mold and mill casing departments full, and its business in structural lines is also good, orders on its books at present running between 4000 and 5000 tons.

The Graham Nut Company, Pittsburgh, reports its nut and bolt departments running full, the railroads having placed considerable business recently. The company has lately installed additional threading machines, considerably increasing its output. Prospects for future business are very good.

Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, was put in blast September 11, after being idle since last January. The stack has been relined, the stoves relined and raised and other important improvements made, practically all the steel work having been done by the Meehan Boiler & Construction Company, Lowellville, Ohio. Heyl & Patterson, Inc., Pittsburgh, are now building a pig casting machine at the furnace, it being the intention to furnish molten metal to the Bessemer steel plant of the Youngstown Sheet & Tube Company, at East Youngstown.

J. William Barnes, of Houston, Tex., was in Pittsburgh last week securing estimates on the cost of equipment for a rolling mill to be erected at Houston. Mr. Barnes represents the Penn City Steel Company, which has been organized to build a plant in which bars, angles and other shapes will be rolled from old rails.

With the view of starting up the blast furnace of the Bird Iron Company, Ironton, Ohio, which has been idle about two years, efforts are being made to effect a reorganization of that company.

The blast furnace of the Norton Iron Works, Ashland, Ky., which has been rebuilt with larger capacity, will be blown in soon, probably about October 1. It will be run on Bessemer iron.

General Machinery.

A pumping engine, or motor driven centrifugal pumps, of moderate capacity, will be installed by Jasonville, Ind., the coming year. Bids will not be taken, however, until plans for the construction work recently authorized have been approved.

Two electrically driven centrifugal pumps and other machinery will be purchased in October for a new municipal pumping station at Ironwood, Mich., the plans for which have just been completed.

C. R. & J. I. Phillips of the Charles Phillips Tool Company, Mannington, W. Va., are building an automobile garage in connection with which will be used the modern machine shop of the tool company.

The Reliance Motor Cycle Company, W. H. Ives, manager, Owego, N. Y., is about to engage in the manufacture of automobiles and will soon start construction on a machine shop addition to its plant, 40 x 150 ft., of concrete construction. Other improvements are to be made later.

The Connellsville Iron Works, Connellsville, Va., has purchased the complete boiler shop equipment formerly owned by J. C. Sloan, which it will install in its plant. The company has recently installed a new Wickes bending roll with a capacity of ½-in. plates 10 in. wide.

The Crescent Machine Company, Leetonia, Ohio, manufacturer of planers, band saws, surfacers and other woodworking machinery, has recently completed a new steel and brick building, 80 x 112 ft., to serve as a showroom and warehouse. It is operating its plant to normal capacity and reports business good. Its mechanical department is developing a new line of safety heads for joints and planers, which will be ready for the trade about October 1. The company will also shortly offer a new self-contained motor driven planer, in sizes from 18 to 26 in. inclusive, with which it expects to do considerable business.

Plans are being made by the Chicago, Burlington & Quincy Railroad for the building of repair shops at some point in Nebraska, probably Havelock.

The Precise Company has been organized at Indianapolis, Ind., with $10,000 capital stock to manufacture machinery. The directors are Angel Afanador, John E. Parker, Olin W. Morgan and H. L. Lebach.

Foundries.

The Union Steel Casting Company, Pittsburgh, reports through C .C. Smith, its president, that the company's business based on orders booked and prospects for the future, is good, the current business coming from railroads, locomotive builders, bridge manufacturers, &c. The department devoted to the manufacture of Union Cast steel annealing boxes for sheet and tin plate mills also shows improvement.

The Prizer-Painter Stove & Heater Company, Reading, Pa., intends to rebuild the part of its plant which was recently destroyed by fire as soon as the insurance can be adjusted.

The Greer Iron Works, Greer, S. C., recently incorporated, has installed a new plant which is about ready for operation.

The Altavista Foundry & Machine Company, Altavista, Va., recently incorporated with a capital stock of $25,000, has just completed a new concrete foundry equipped with one cupola and having a completely equipped machine shop attached. The foundry will have a daily capacity of about 20 tons of iron castings and a specialty will be made of grate bars. H. L. Lane is president; John E. Lane, vice-president, and Frank Stevens, secretary.

Power Plant Equipment.

The city of Tyndall, S. D., is contemplating the construction of a municipal lighting system and pumping station, also the installation of a gas producer engine, but plans and specifications have not as yet been completed.

The Oriolo Mining Company, Ridgway, Pa., has decided upon the purchase of a Corliss engine.

The Ft. Dodge, Des Moines & Southern Railroad is making extensive improvements in its power plant at Frazer, Iowa.

J. Reichanadter, proprietor of the Lake Charles Boiler Works, has moved his plant to Lake Charles, La. Special attention is given to the manufacture and repair of steam boilers, heaters, tanks and smokestacks.

The Rocky Ford Milling & Power Company, Manhattan, Kan., is installing a water power electrical plant at Rocky Ford, 4½ miles from Manhattan, which is designed to develop 1200 to 1500 hp. The installation includes a 12-ft. dam and a new power house for which two 62-in. Sampson Leffel wheels and an Allis-Chalmers dynamo have been purchased. When this equipment is in operation two more wheels and an additional dynamo will probably be installed for the supply of current to Fort Riley and Junction City, Kan. Transmission lines are to be carried on cement poles.

A steam turbine power station, similar to that now operated by the Evansville Terminal Railroad is contemplated by the newly organized Evansville, Mt. Carmel & Olney Interurban Railroad, Evansville, Ind.

Ferris Bros., Watertown, S. D., will be in the market this fall for electrical machinery, as they contemplate reconstructing the power and lighting plant.

A rotary converter and transformers for the new Mt. Washington substation will be required by the Pittsburgh Railways Company, Pittsburgh, Pa.

An alternating current generator of 500 kw. capacity will be installed by the Sheffield Car Company next month in its plant at Three Rivers, Mich.

Substation equipment and possibly a new power generating unit will be required by the Morris County Traction Company, Morristown, N. J., when the proposed extension to Mt. Tabor is completed.

The Council of Lodi, N. J., will receive bids until September 20 for the construction of a water supply system, including pumping station, pumps, engines and other appurtenances, cast iron pipe, hydrants, valves, reservoir, driven well, &c. Plans and specifications may be seen and proposals obtained at the office of the Borough Clerk, Lodi; Lemuel Lozier, engineer, Bank Building, Hackensack, N. J., and James H. Fuertes, consulting engineer, New York.

A centrifugal pump, to be driven either by electric or gasoline motor, will be required in the spring by Foley, Minn., for the proposed water plant. Construction bonds have been voted.

New Corliss engines and electric generators will be added to the main station of the Central Arizona Power Company, Wickenburg, Ariz.

An underwriters' fire pump will be purchased next month by Rochester, Vt., $5000 bonds having been voted for the purpose.

The city of Toronto, Ont., has extended the date to October 28 for the receipt of bids for turbine pumps, valves, piping, bed plates, couplings, &c., and for synchronous and induction motors, with exciters, switchboards and connecting material for its pumping and power plant. The city engineer will furnish specifications and form of tender upon application. The pumps required are four 13,500,000-gal., four 10,000,000-gal., four 6,500,000-gal., two 5,000,000-gal. and four 1,500,000-gal.

The Buckeye Engine Company, Salem, Ohio, through its Pittsburgh office, James T. Castle, manager, has received the following contracts: 250 hp. engine connected with 150 kw. Fort Wayne electric generator, Union Drawn Steel Company, Beaver Falls, Pa., which is installing a 250 hp. Russell engine connected with a 150 kw. Western electric generator and Wickes boilers of 500 hp. capacity; 250 hp. engine connected with 150 kw. generator, United States Sanitary Mfg. Company, Monaca, Pa., which is building a new cupola, and which has placed orders for two 5-ton traveling cranes; 150 hp. gas engine connected with 100 kw. Westinghouse generator, T. A. Rodefer Glass Company, Bellaire, Ohio; 450 hp. cross compound engine

connected with 300 kw. Westinghouse generator, Driggs-Seabury Ordnance Corporation, Sharon, Pa.; 1000 hp. cross compound engine, Carnegie Steel Company, for installation in the McCutcheon Mills, North Side, Pittsburgh; 300 hp. engine for driving mine ventilating fan, W. Harry Brown Coal Company, Brownsville, Pa.

The Babcock & Wilcox Company, through its offices in the Farmers' Bank Building, Pittsburgh, has recently made the following sales of Babcock & Wilcox water tube boilers: Republic Iron & Steel Company, Youngstown, Ohio, 3000 hp.; Rochester & Pittsburgh Coal & Iron Company, for development at Punxsutawney, Pa., 5000 hp.; Upson Nut Company, for installation in the new mill being erected in Cleveland, Ohio; Youngstown Sheet & Tube Company, for installation at the new blast furnaces being built at Youngstown, Ohio.

The Pittsburgh Feed Water Heater Company, with office and plant at Twenty-seventh street and Liberty avenue, Pittsburgh, reports recent sales as follows: The Forged Steel Wheel Company, Butler, Pa., 10,000 hp. horizontal feed water heater; West Penn Steel Company, Brackenridge, Pa., 2500 hp. open type vertical feed water heater; Southern-Cambria Railway Company, South Fork, Pa., 1500 hp. heater and receiver; National Valve & Mfg. Company, Pittsburgh, for Peerless Coal & Coke Company, East Vivian, W. Va., 900 hp. heater; Ryther & Pringle, Carthage, N. Y., for Benson Mines Company, Benson Mines, N. Y., 400 hp. heater; T. H. Nevin Company, North Side, Pittsburgh, 200 hp. heater; Althom Sand Company, Thompson, Pa., 150 hp. heater.

Contracts will be let in a short time for the machinery required for an additional 10,000 hp. to the hydroelectric plant of the San Joaquin Light & Power Company, Fresno, Cal. This project includes the enlarging of the Crane Valley dam and reservoir and the enlargement and extension of the flume lines. Several hundred men are now engaged on this part of the work, which has been progressing steadily since about June 1. Specifications and plans for the hydraulic and electrical machinery and the pipe line can be had upon application to J. G. White & Co., 43 Exchange place, New York, designing and supervising engineers in charge of the work.

An independent electric road to connect the Eastern Pennsylvania Railroad system with the power station at Pottsville, Pa., to the Schuylkill Traction Company's lines will probably be built next spring through Shenandoah, Delano, Morea and St. Clair. A 2000-kw. steam turbine and generator, with two rotary converter and transformer stations, have been tentatively decided upon. For further information address the Mayor of Pottsville.

A municipal power and lighting plant of about 200 hp. has been decided upon by Erick, Okla.

The Plattsburg (N. Y.) Gas & Electric Company, a combination of local power and lighting interests, will be in the market this winter for new machinery.

Bridges and Buildings.

The International Steel & Iron Construction Company, Evansville, Ind., has purchased the building formerly occupied by the M. A. Hunt Company, in addition to which other buildings will be erected, and when completed the entire plant will comprise a floor space of 94,000 sq. ft. Electric power will be developed by gas engines and gas producer units. The company will make a specialty of steel scaffolding for rental to contractors and a steel trap door for mine use, both articles being protected by patents. Other products will include fire escapes, complete store fronts and all kinds of ironwork for buildings.

Fires.

The plant of the Meteor Motor Car Company, Davenport, Iowa, was partly burned September 10, the loss being about $40,000.

The plant of the Railway Steel Spring Company, at Pittsburg, Pa., was damaged $30,000 by fire September 7.

The Hagerstown Foundry Company's plant at Hagerstown, Md., was burned September 7.

The plant of the Sedro-Wooly Iron Works, at Sedro-Wooly, Wash., was burned September 1, with an estimated loss of $25,000.

The plant of the Kings County Iron Works, Brooklyn, N. Y., was burned September 2. The loss is placed at $15,000.

Fire which started at an early hour September 11 burned a portion of the warehouse of the S. Obermayer Company's plant in Cincinnati, Ohio. None of the manufacturing departments were burned, and the statement is made that the business will suffer no interruption.

Hardware.

The corporate title of the Michigan Stove & Caster Company, Grand Rapids, Mich., has been changed to the Diamond Steel Truck Company, of which G. A. Hendricks is president and general manager. The company will manufacture a steel caster and 50 more men will soon be added to the present force of 125.

The Indiana Foundry Company, Ltd., Indiana, Pa., has just installed another cupola and is increasing the capacity of its plant about 25 per cent. in view of the excellent prospects for future business.

The New Hygienic Refrigerator Company, Indianapolis, Ind., has been incorporated with a capital stock of $25,000 to manufacture refrigerators. The directors are Frank M. Smith, Harry F. Smith and Carsten Claussen.

The Kokomo Nail & Brad Company, Kokomo, Ind., has increased its capital stock from $150,000 to $180,000. The company intends to add to its present line the manufacture of all kinds of metal working machinery.

The Imbler Fence & Mfg. Company, Alexandria, Ind., has increased its capital stock from $35,000 to $60,000.

Miscellaneous.

The Pittsburgh Galvanizing Company, Twenty-sixth and Railroad streets, Pittsburgh, is operating its plant full time on galvanized angles and channels for windmill purposes, and also on hoops and bands. In the smaller sizes of hoops and bands its trade shows an increase of 50 per cent. in the last six weeks. Its trade in galvanized angles and channels also shows an improvement, orders for 400 tons for export having recently been booked.

Pumps for a water works and sewage system will be purchased this winter by Mena, Ark. Plans for the complete equipment have not yet been prepared.

The Turner-Roland Company, Des Moines, Iowa, has taken a contract for steel tower and tank, motor driven pump and accessory apparatus for the new water works system at Greenfield, Iowa.

Bids will be taken early next winter for pumping machinery to be installed in the new water works at Austin, Minn.

A stamp mill and cyanide plant is to be erected this fall by the Eagle Mining Company, Edwardsburg, Idaho.

At a recent meeting of the directors John W. Hogan was elected president and treasurer and Harry L. Donnelly secretary of the Safety Elevator & Machinery Company, Kansas City, Mo. These officers, with H. A. Van Doren and Claus Stellings, constitute the Board of Directors. The company expects to place its plant in operation at an early date, manufacturing freight and baggage elevators and elevator safety devices.

The American Vulcanized Fibre Company, Wilmington, Del., is rebuilding the part of its plant which was recently destroyed by fire. No new machinery will be required.

The W. L. Holman Company, operating a freight and passenger car plant at San Francisco, Cal., has consolidated with the Pacific Car & Foundry Company and will erect a new plant at Richmond, Cal., to cost about $300,000. A tract of 20 acres of land has been secured upon which the new plant will be erected as quickly as possible. The company's business has increased considerably, and several good contracts have been lost because the company did not have sufficient capacity to make prompt delivery. The capacity of the present plant is about five freight cars per week and four passenger cars a month. In the new plant the company will be able to build 10 freight cars a week and about 10 passenger cars a month.

At a special election held on August 24 the city of Crescent, Okla., voted a bond issue of $30,000 for the construction of a water works system and an electric light plant, the former to cost $20,000 and the latter $10,000.

The installation of a municipal water works, sewerage system and electric light plant is being considered by Erie, Kan. Preliminary surveys and estimates are being prepared by Burns & McDonnell, Scarritt Building, Kansas City, Mo.

Contracts for the construction of a municipal water works and electric light plant at Hydro, Okla., will be awarded about September 20.

The Keystone Furnace Construction Company, Pittsburgh, engineer and contractor and builder of Knox patent cooling doors, frames, &c., for open hearth furnaces, will shortly make a shipment of water cooled ports to the Duquesne Works of the Carnegie Steel Company, Pittsburgh. Other recent orders include the following: Second order for ports for the American Steel & Wire Company, Cleveland, Ohio, and four ports for the Pennsylvania Steel Company, Steelton, Pa.

The Board of Water Supply, Auburn, N. Y., is having plans prepared for a pumping station and filtration plant, to cost approximately $170,000. Bids will be called for about December 1.

The Public Safety Appliance Company has been incorporated at Albany, N. Y., to manufacture fire, police and watchmen alarm systems and appliances. Perry J. Fitzgerald and Geo. Haswell of Albany and Theodore M. Brush of Elyria, Ohio, are the incorporators.

The Fitz Gerald & Bennie Laboratories, Niagara Falls, N. Y., have purchased for a client 14 acres of land at Chippawa. It is the intention to erect a plant on the property to make electric furnace products, nonmetallic, the equipment for which will be installed about next February.

The Ideal Auto Starter Company has been incorporated at Indianapolis, Ind., with $25,000 capital stock to manufacture gas and gasoline engine starters and other devices. The directors are W. K. Bellis, S. P. Woodward, A. L. Smith, R. T. Snapp and N. D. Woodward.

The Iron and Metal Trades

Large Purchases of Steel Rails.

A Shortage in Steel.

Steel rail purchases have been the leading feature of the markets this week, the total figuring up close to 250,000 tons. The Lackawanna Steel Company has accepted about 40,000 tons for this year's delivery, including 20,000 tons for the Northern Pacific and 5000 tons each for the St. Paul, Burlington and Lake Shore. The Ensley mill has entered 85,000 tons for next year, of which 30,000 tons is for the Louisville & Nashville, 25,000 tons for the 'Frisco, 20,000 tons for Harriman lines and 10,000 tons for the Atlantic Coast Line. The Illinois Steel Company has booked 90,000 tons, which includes 40,000 tons for Harriman lines, and the Carnegie Steel Company has taken 20,000 tons. There has been a good deal of activity, too, in track material.

A shortage in steel billets is developing. It seems most acute in the Chicago District and is making itself felt in Pittsburgh. The result is that Eastern steel works are selling steel westward and that tidewater consumers have taken up with importers the question of securing supplies from abroad, particularly for small sizes of billets.

Interest in steel bars is developing for next year's delivery. It is believed that buying for the first quarter and the first half of 1910 will soon again begin, notably in the Chicago District. The Carnegie Steel Company has issued a new net list of extras on bars and shapes.

New orders for structural material have been rather light, the most noteworthy sale being a lot of 5000 tons of plain material, to a Canadian fabricator. The leading makers have advanced prices to the 1.50c. base for structural material and plates. The Steel Corporation has placed an additional order for three ore boats, and will also build a new dock on upper Lake Superior, to be finished for the next season.

The markets for pig iron have again been quite active, the steel makers being the most eager purchasers. In the East there have been sales of basic iron for early delivery to the extent of 10,000 tons on the basis of $18, delivered, while the sales for delivery during the first half of next year aggregate about 25,000 to 30,000 tons at close to $18. The majority of the furnaces are now asking $18.50, delivered. Buyers report that they are being offered foreign basic pig at prices close to these, but it must be remembered that while foreign pig iron producers can make the grade of iron needed it is an unusual quality with them.

In the Pittsburgh District there have been sales of Bessemer and basic pig aggregating about 50,000 tons, and there is a renewal of the reports that the Steel Corporation may enter the market for a moderate tonnage.

The buying of foundry iron has been good. A pretty large tonnage has been placed in the territory between Albany and Buffalo. Some large inquiries are drifting in for next year's delivery, one of them calling for 24,000 tons. The Southern furnaces are booking some business, but are not pushing sales. There are reports of some low offerings of Middlesbrough iron, notably in New England, but while importations are imminent, the margin is still too small to tempt importers. The stiffening of freight rates is an adverse factor in the situation.

Foreign melting scrap has been sold for importation, and it looks as though further business may be done. An interesting event will be the opening of the bids for scrap from the Isthmus of Panama. The quantity is estimated as high as 140,000 tons, which is to be shipped at the rate of 1000 tons a week.

The returns of the Copper Producers' Association have been a damper upon the enthusiasts. While our own consumption is undoubtedly expanding, it will take a corresponding improvement abroad before a sustained betterment in price can be developed. The coming of winter may delay what seems an inevitable balancing of output and consumptive requirements.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept.15, 1909.	Sept.8, 1909.	Aug.18, 1909.	Sept.16. 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	**$18.00**	$17.75	$17.25	$16.75
Foundry No. 2, Southern, Cincinnati	**17.25**	17.25	16.25	15.75
Foundry No. 2, local, Chicago	**18.50**	18.50	17.00	16.85
Basic, delivered, eastern Pa.	**18.00**	18.00	17.25	15.25
Basic, Valley furnace	**15.75**	15.75	15.25	14.50
Bessemer, Pittsburgh	**17.90**	17.90	16.90	15.90
Gray forge, Pittsburgh	**15.90**	15.90	15.15	14.40
Lake Superior Charcoal, Chicago	19.50	19.50	19.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	**25.00**	25.00	24.00	25.00
Forging billets, Pittsburgh	**29.00**	29.00	28.00	27.00
Open hearth billets, Philadelphia	**27.50**	27.50	27.00	26.20
Wire rods, Pittsburgh	**31.50**	31.00	31.00	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**16.50**	16.00	16.00	15.00
Steel rails, melting, Philadelphia	**17.25**	17.25	17.00	15.25
Iron rails, Chicago	**19.00**	19.00	18.50	18.00
Iron rails, Philadelphia	**20.00**	20.00	19.75	20.50
Car wheels, Chicago	**18.50**	17.75	16.00	15.25
Car wheels, Philadelphia	**17.00**	16.50	16.00	15.00
Heavy Steel Scrap, Pittsburgh	**17.50**	17.25	16.50	14.25
Heavy steel scrap, Chicago	**16.00**	15.75	15.00	13.00
Heavy steel scrap, Philadelphia	**17.25**	17.25	17.00	15.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents
Refined iron bars, Philadelphia	**1.52**	1.50	1.45	1.45
Common iron bars, Chicago	**1.45**	1.45	1.40	1.50
Common iron bars, Pittsburgh	1.50	1.50	1.50	1.40
Steel bars, tidewater, New York	**1.56**	1.56	1.51	1.56
Steel bars, Pittsburgh	**1.40**	1.40	1.35	1.40
Tank plates, tidewater, New York	**1.66**	1.56	1.56	1.76
Tank plates, Pittsburgh	**1.50**	1.40	1.40	1.60
Beams, tidewater, New York	**1.66**	1.56	1.56	1.76
Beams, Pittsburgh	**1.50**	1.40	1.40	1.60
Angles, tidewater, New York	**1.66**	1.56	1.56	1.76
Angles, Pittsburgh	**1.50**	1.40	1.40	1.60
Skelp, grooved steel, Pittsburgh	**1.40**	1.40	1.35	1.45
Skelp, sheared steel, Pittsburgh	**1.50**	1.50	1.45	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh*	1.80	1.80	1.80	1.95
Cut nails, Pittsburgh	1.75	1.75	1.75	1.80
Barb wire, galv., Pittsburgh*	2.10	2.10	2.10	2.40
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*13.50*	13.50	13.62½	13.75
Electrolytic copper, New York	*13.00*	13.12½	13.25	13.50
Spelter, New York	**5.85**	5.85	5.75	4.75
Spelter, St. Louis	**5.70**	5.70	5.60	4.60
Lead, New York	**4.40**	4.40	4.37½	4.32½
Lead, St. Louis	**4.30**	4.30	4.25	4.40
Tin, New York	*29.90*	29.95	30.02½	28.55
Antimony, Hallett, New York	**8.37½**	8.37½	8.12	7.75
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.64	$3.64	$3.64	$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c., net; I-beams over 15 in., 1.60c., net; H-beams over 8 in., 1.70c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.55c., net; angles, over 6 in., 1.60c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.70c., base, half extras, steel bar card; tees, 3 in. and up, 1.60c., net; zees, 3 in. and up, 1.55c., net; angles, channels and tees, under 3 in., 1.45c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.75c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.50c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼ in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c.; box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c.; galvanized sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.35c.; No. 30, 3.60c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized roofing sheets, No. 28, $2.80 per square for 2½ in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, ¾ to 6 in., are 75 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel
1 to 1½ in.	50
1¾ to 2¼ in.	62
2¾ to 5 in.	70
2½ in.	64
6 to 13 in.	62

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Wire Rods.—Bessemer, open hearth and chain rods, $31.50 to $32.

Steel Rivets.—Structural rivets, 1.80c., base; boiler rivets, 1.90c., base, subject to usual extras.

Chicago.

FISHER BUILDING, September 15, 1909.—(*By Telegraph.*)

The demand for iron and steel products continues exceptionally strong. The steel mills are all overloaded with specifications and in some lines, including plates, shapes and bars, shipment of new orders is not being promised earlier than November. One local independent mill is practically out of the market for the rest of the year. Inquiries are beginning to come in for forward delivery, and while but few contracts outside of bars have been so far entered for first quarter and half of 1910, buying for this period will probably soon begin. The scarcity of steel is unabated, the mills usually supplying the market being short of billets for the requirements of their own finishing departments, all of which are running full. Railroad demand is now a prominent feature of the market, and is expected to continue so for some time to come. In addition to new standard rail orders amounting to 60,000 tons taken last week by the leading interest, some heavy contracts for delivery exclusively in 1910 are under consideration. The growing needs of the railroads are also reflected in liberal purchases of track fastenings as well as in the large tonnage for plates being specified by the car shops. Old car wheels, which until within a few weeks have been without movement of consequence, are quite active owing to the fuller operation of car wheel foundries. Prices have risen $2.50 a ton inside of four weeks, but even this price has not brought out many of the large lots that are still being held for a strong advance. A large amount of prompt business in the heavy lines of finished material is being diverted to jobbers who are able to ship orders from stock. An advance of $1 a ton was announced on Tuesday by the leading jobbers, making the price on steel bars 1.80c., base, plates and structural shapes, 1.90c., base, and hoops, 2.30c., base, Chicago. Three more open hearth furnaces have been fired at the Gary Works and four others will be started in a few days. This will bring the total number in operation at this plant up to 21.

Pig Iron.—From the viewpoint of furnace interests, conditions in the pig iron market are quite satisfactory. The advances thus far made have been sustained and prices are firm, with an upward tendency. There is apparently but little open tonnage available for last quarter delivery among either Northern or Southern furnaces, and it is understood that the latter are fairly well sold up through the first quarter of next year. A few sellers of Southern iron are offering it for this period at $14, at which price the market is firm. There are a good many scattered inquiries for moderate lots in the market, mostly for first quarter, and a fair number of orders of this sort were entered last week. Two or three lots of 1000 to 2000 tons are under consideration, but the general run of business ranges between 200 and 500 tons. It is believed that the requirements of melters for the last quarter of this year are pretty well covered, and interest is now centered largely in purchases for the first quarter. None of the sellers of Southern iron is quoting for second quarter, but one Northern producer is selling through the first half at $18.50, Chicago. A fairly good demand is observed for charcoal iron, with sales of about 5000 tons reported for last week. By the end of the week there will be but little idle capacity among the merchant furnaces of the Chicago District. Thomas Furnace, at Milwaukee, was blown in last week, after a shutdown of about two months, and the second Mayville Furnace of the Northwestern Iron Company is now going. The B furnace of the Iroquois Iron Company, which has been idle for nearly two years, will go in the latter part of this week, and Spring Valley, the only remaining merchant furnace out of commission, is expected to start up in October or November. The following prices are for September delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	19.00 to 19.50
Northern coke foundry, No. 2	18.50 to 19.00
Northern coke foundry, No. 3	18.00 to 18.50
Northern Scotch, No. 1	18.50 to 19.00
Southern coke, No. 1	18.85 to 19.35
Southern coke, No. 2	18.35 to 18.85
Southern coke, No. 3	17.85 to 18.35
Southern coke, No. 4	17.35 to 17.85
Southern coke, No. 1 soft	18.85 to 19.35
Southern coke, No. 2 soft	18.35 to 18.85
Southern gray forge	16.85 to 17.35
Southern mottled	16.60 to 17.10
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %	21.90 to 22.40

(*By Mail.*)

Billets.—Owing to the inability of the mills to keep up with their own requirements for steel, no billets are being offered in the market by local producers. The forge shops and other users of forging billets are clamoring for shipments of their specifications against contracts entered some time ago, and are in many cases unable to secure material as fast as needed. Under the circumstances there are no quotable prices for this market, which is dependent wholly upon outside sources.

Rails and Track Supplies.—Final closure of about 50,000 tons of standard section rails included in requirements arranged for about three weeks ago has been effected within the past week; and in addition to this new orders aggregating 60,000 tons have been placed with the leading interest. Of the latter 25,000 tons of open hearth rails went to the Ensley mill, and the remaining 35,000 tons, of which 10,000 tons was open hearth, going to the Illinois Steel Company. Most of this business is for delivery next year, and some of it will, if possible, be rolled sooner. The orders taken were all placed by Western lines, from which previous orders have recently been received. The Illinois Steel Company's mills are now well taken care of for the rest of the year, including the light rail mill, which is rolling up to 60 lb. sections. It is understood that several of the leading railroads are preparing to come into the market for large quantities of rails for 1910 delivery, and some heavy bookings of this character are likely to be made in the near future. Specifications for track fastenings continue heavy and there is a large amount of new business in sight. Mills are being pressed for deliveries on spikes and bolts and are running at full capacity. Light rail orders taken by the leading interest are running at the rate of 6000 to 7000 tons per month, and prices continue firm at the following quotations: 40 to 45 lb. sections, $26; 30 to 35 lb. sections, $26.75; 16, 20 and 25 lb. sections, $27; 12-lb. sections, $28, Chicago, less 50c. a ton on lots of 500 tons and $1 a ton on lots over 500 tons.

Structural Material.—The largest fabricating order placed in this market last week was for the steel required in the new Sherman House, 5000 tons, which was taken by the Morava Construction Company. The Children's Hospital, San Francisco, 436 tons, and a bascule bridge, 1000 tons, for the Chicago & Northwestern near Hammond, Ind., were secured by the American Bridge Company. This interest also secured several thousand tons of railroad specifications, including bridge and turntable material. Among the projects which will call for a large tonnage of structural material is the contemplated erection by the United States Steel Corporation of another large steel ore dock at the upper end of Lake Superior. Present plans contemplate the erection of this structure in time to have it ready for service when

navigation opens in the spring. Scarcity of steel, together with a steady flow of specifications, has prevented the mills from making much headway in catching up on deliveries, which are still running far behind. Prices on plain material are unyieldingly firm, the inside figure now being made by the mills being 1.68c., base, Chicago, with a premium of $1 a ton or more obtained by some mills on specifications that can be furnished promptly. Material from store is strongly held at 1.85c., base, Chicago, but there are rumors of an impending advance of $1 or more a ton above this level.

Plates.—The congested condition of plate mills precludes any confident promise of shipment on new orders within six to eight weeks or longer. It is now wholly a question of getting out the material, as the demands coming from consumers are becoming more and more urgent. Specifications of heavy tonnage are being placed by car and bridge shops, which are now actively engaged. The latter especially are crowded with work, with every prospect of a sustained demand. None of the mills is this week quoting better than 1.68c., Chicago, and a premium over this price is obtainable on prompt shipments. Few mills, however, are able to execute orders without extended delay, and immediate requirements are therefore supplied maiuly from warehouse stocks. Store prices are firm with an advancing tendency, and it is probable that the present prices of 1.85c. will soon be advanced $1 more a ton. Mill prices have firmed up to 1.68c., Chicago, which is now quoted as minimum.

Sheets.—Although somewhat backward in getting under headway, the demand for sheets is now well abreast of that of other steel products. The mills are well filled up, few, if any, being able to enter orders for shipment sooner than six weeks at the earliest. The Indiana Harbor mill is declining to quote for this year's delivery, being entirely sold up to January 1. On account of these conditions a good deal of business is being diverted to jobbers. Both mill and store prices are being firmly maintained.

Bars.—The volume of orders against contracts continues very heavy, and the difficulty experienced by mills in satisfying the demands of the trade for shipments is not diminishing. None of the mills is in position to accept new business for shipment inside of eight weeks, and some are practically out of the market. While in last report 1.58c., Chicago, was quoted on steel bars as the outside spread of the market, it stands this week as an inside price, with some mills asking $1 a ton more. Several bar iron contracts of 1000 tons or more have been placed within the past week or 10 days at 1.45c., and though this might still be done on desirable specifications, 1.50c., Chicago, is being generally quoted.

Merchant Pipe.—Each week brings a slightly increased volume of business in merchant pipe, but thus far jobbers have gauged their orders according to current demand, depending upon fairly prompt mill shipments to replenish their stocks. While no serious inconvenience has yet been occasioned by delayed deliveries, they are beginning to lengthen out a little. Although there has been more or less talk of a contemplated advance, no change from the present schedule has been announced.

Boiler Tubes.—The demand for boiler tubes reflects none of the stimulation observed in other mill products. Outside of the moderate run of specifications from the large boiler shops and jobbers, most of the small orders for merchant tubes are being taken care of from store stocks.

Cast Iron Pipe.—A few municipal lettings ranging from 300 to 500 tons represent the bulk of last week's transactions. In addition to those were a few orders from railroads for Culvert pipe, aggregating about 1000 tons. Inquiries are beginning to come in from some of the large consumers of pipe for deliveries next year, but most of these are as yet of a tentative character and have not resulted in the placing of orders. We quote per net ton, Chicago, as follows: Water pipe, 4-in., $27.50; 6 to 12 in., $26.50; 16-in. and up, $25.50, with $1 extra for gas pipe.

Metals.—Buying is chiefly confined to small lots for immediate requirements. No sales of any consequence were included in last week's transactions, but inquiries coming out from some of the larger consumers are believed to foreshadow liberal purchases of copper. Old metals are especially dull and quiet, but prices are without quotable change, as follows: Casting copper, 13¼c.; lake, 13¾c. to 14c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 31¾c.; small lots, 33c.; lead, desilverized, 4.45c. to 4.55c., for 50-ton lots; corroding, 4.70c. to 4.80c., for 50-ton lots; in car lots, 2½c. per 100 lb. higher; spelter, 5.75c. to 5.85c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¼c.; copper bottoms, 11½c.; copper clips, 12¼c.; red brass, 11½c.; yellow brass, 9¼c.; light brass, 6¾c.; lead pipe, 4½c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—A fair demand for melting steel and foundry scrap, coupled with a very optimistic feeling among dealers, holds the market steady and has even pushed values on some grades up a notch or two. The advent of a large consumer in the market for several thousand tons of melting steel and cast scrap gave the market a bullish turn; $15 was paid for 1800 tons of No. 1 cast. Sales aggregating between 3000 and 4000 tons of car wheels have been made at prices ranging from $18 to $18.50. There is unquestionably a large tonnage of scrap being held in local yards, and dealers are inclined to hold back for higher prices. While no large amount of material has appeared recently in railroad lists, a good deal is being disposed of by the roads at private sale. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails	$19.00 to $19.50
Old steel rails, rerolling	17.50 to 18.00
Old steel rails, less than 3 ft	16.50 to 17.00
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheels	18.50 to 19.00
Heavy melting steel scrap	16.00 to 16.50
Frogs, switches and guards, cut apart	16.00 to 16.50
Shoveling steel	15.50 to 16.00

The following quotations are per net ton:

Iron angles and splice bars	$18.00 to $18.50
Iron car axles	20.50 to 21.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.50 to 15.00
Springs, knuckles and couplers	15.00 to 15.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	13.00 to 13.50
Steel axle turnings	11.50 to 12.00
Machine shop turnings	9.25 to 9.75
Cast and mixed borings	7.00 to 7.50
No. 1 busheling	12.75 to 13.25
No. 2 busheling	9.75 to 10.25
No. 1 boilers, cut to sheets and rings	11.50 to 12.00
No. 1 cast scrap	14.75 to 15.25
Stove plate and light cast scrap	12.50 to 13.00
Railroad malleable	15.75 to 16.25
Agricultural malleable	13.25 to 13.75
Pipes and flues	11.50 to 12.00

Pittsburgh.

PARK BUILDING, September 15, 1909.—(*By Telegraph.*)

Pig Iron.—The Jones & Laughlin Steel Company has bought from the Bessemer Pig Iron Association 20,000 tons of standard Bessemer iron for delivery in the last quarter of this year at $17, at furnace, or $17.90, Pittsburgh. This company has been buying Bessemer and basic iron freely in the last three or four weeks, and has bought all told 40,000 to 50,000 tons of Bessemer and 10,000 to 15,000 tons of basic. The company is buying pig iron to insure itself against delay in the starting of one or two of its new blast furnaces at Aliquippa, Pa. One of these furnaces was scheduled to start October 15, but it will not be ready before November 15, if then, and a second stack will not likely be ready until December or January. The company is making about 70,000 tons of pig iron per month at its five Eliza and one Soho furnace in Pittsburgh, but is using more than this output, as its Bessemer steel plant and Talbot furnaces are all running full and making over 3000 tons of steel ingots per day. A local interest bought last week 20,000 tons of Bessemer from Josephine Furnace of Corrigan, McKinney & Co., at Josephine, Pa., at $16.75, at furnace, the freight to Pittsburgh being 75c. a ton. Other small sales of Bessemer and basic iron have been made, and the market is quite active. Foundry iron is in heavier demand, most of the foundries in the Pittsburgh District now running full time. We quote standard Bessemer, $17; basic, $15.75; No. 2 foundry, $15.75 to $16; malleable Bessemer, $16, and gray forge, $15, all at Valley furnace, for balance of this year delivery, the freight to Pittsburgh being 90c. a ton.

Steel.—It is rapidly getting to be a question of where enough steel is to come from to meet the heavy consumption, there already being a shortage in supply which promises to become more acute, as consumption is steadily increasing. We note a sale of 1000 tons of small Bessemer billets at $26, and a sale of 1500 tons of 4 x 4 in. open hearth billets at about $26.50, Pittsburgh, also a sale of 2000 tons of long length sheet bars at $26, Youngstown, for delivery to a nearby mill. We quote Bessemer billets, 4 x 4 in., at $25 to $25.50; open hearth billets, $26 to $26.50, and forging billets, about $29, all f.o.b. Pittsburgh, full freight added. Sheet and tin bars in random lengths are very firm at $26.50 to $27, Pittsburgh, full freight added. Standard, 4 x 4 in., Bessemer billets are $25, and random length sheet and tin bars $26, f.o.b., Youngstown, full freight added.

(*By Mail.*)

As showing the great pressure of the steel makers to get pig iron, we can state that the Carnegie Steel Company, which is now operating 56 out of its 59 blast furnaces, is getting the Steubenville and Zanesville furnaces ready for operation, and they will be started as soon as necessary repairs can be made. These are small isolated stacks, each having a daily capacity of about 200 tons, and are being started only because the company is running short of pig iron. The other idle stack is Carrie No. 7, at Rankin, which is undergoing repairs and which will be started in October. The two Columbus furnaces and the Bessemer steel works at Columbus have been started, all the steel plants of the Carnegie Steel Company now being in full operation and turning out an enormous amount of steel. On Saturday, September 11, this company sent out notices

to the trade of another advance in prices of structural material and plates of $2 a ton. Structural material and ¼-in. plates are now 1.50c., base, and steel bars are 1.40c. The others makers of structural steel and bars are also quoting these prices, with the exception of several makers of steel bars, including Cambria and Crucible, who are quoting 1.45c. to 1.50c., at mill. The new demand for practically all kinds of finished material continues heavy, with the exception of wire products and tin plate, for which there is a seasonable dullness. The question of getting enough raw steel to supply the demands of the finishing mills is now the question. There is already a shortage, and it promises to become more acute, as the demands of the finishing mills for billets, sheet and tin bars are enormously heavy and steadily increasing. No other changes in prices were made during the week, but the whole market is strong. Coke for the balance of the year is in good demand and is scarce for prompt shipment. The scrap trade is also active and prices are very strong.

Ferromanganese.—Consumers of ferromanganese are running their plants to fuller capacity now than at any time in nearly two years, and the demand for this alloy is correspondingly heavy. Sales of 200 to 300 tons for the balance of this year have been made at $42.50 to $43, seaboard, the freight to the Pittsburgh District being $1.95 a ton. For delivery over the first half of next year foreign 80 per cent. is quoted at $43.50 to $44, seaboard.

Ferrosilicon.—An active demand is experienced for this material and sales of 150 to 200 tons of 50 per cent. are reported at about $64, Pittsburgh, for delivery over the balance of the year. We quote $23 for 10 per cent. blast furnace ferrosilicon, $24 for 11 per cent., and $25 for 12 per cent., while 50 per cent. is now held at $64 to $64.50, f.o.b. Pittsburgh.

Muck Bar.—The consumption of muck bar is heavier than at any time in the past two years, nearly all the makers using their entire output in their own finishing mills, which leaves a limited tonnage available for the open market. The Kittanning Iron & Steel Mfg. Company is running its muck bar bill at Kittanning, Pa., full time and has a good deal of business on its books. We quote best grades of muck bar, made from all pig iron, at $28.50 to $29, Pittsburgh.

Wire Rods.—The demand is quiet, most consumers having covered their requirements some time ahead several months ago, when prices were $2 to $3 a ton lower than they are now. Higher prices are being asked for rods for prompt shipment, as the available supply is limited. We quote Bessemer, open hearth and chain rods at $31.50 to $32, Pittsburgh.

Skelp.—There is a continued active demand for steel and iron skelp, and the mills are busy with a good deal of work on their books. This is particularly the case with mills rolling sheared iron plates, the demand for which is quite urgent. Prices are firm, and we quote grooved steel skelp at 1.40c. to 1.45c.; sheared, 1.50c. to 1.60c.; groove iron, 1.65c. to 1.70c., and sheared iron plates, 1.80c. to 1.85c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—In the past week the Carnegie Steel Company has taken orders for 6000 to 7000 tons of standard sections, and has also received orders and specifications for about 2000 tons of light rails. As yet no orders for standard sections for 1910 delivery have been placed with the local interest. We are advised of a continued heavy demand for steel axles and splice bars. We quote steel axles at 1.65c. to 1.70c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 23 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. The light rail market is very firm, and it is believed that prices will shortly be higher. We quote standard sections at $28, at mill.

Plates.—The Pittsburgh Steamship Company, the identified interest of the Steel Corporation, has placed orders with the Great Lakes Engineering Works for three ore boats, and the plates and shapes, 11,000 to 12,000 tons, will be furnished by the Carnegie Steel Company. All traces of the recent strike at the McKees Rocks Works of the Pressed Steel Car Company are over, and this company in a few days will commence to specify with the Carnegie Steel Company for heavy quantities of plates, shapes and bars. The Standard Steel Car Company is now making about 50 steel cars per day, but will soon be turning out a larger number, as it has recently acquired the Middletown Car Works, and is now negotiating for the purchase of the plant of the South Baltimore Car Works, at South Baltimore, Md. The engagements of the Carnegie Steel Company on plates are such that its entire capacity of over 1,000,000 tons a year is practically provided for, and it cannot promise deliveries now on new orders inside of six weeks to two months. The Great Northern Railroad is in the market for 1000 to 1500 steel cars, and the Chicago, Burlington & Quincy, the Illinois Central and the Rock Island also have inquiries out for a large number. On September 11 the Carnegie Steel Company and the Jones & Laughlin Steel Company advanced prices on ¼ in. and heavier plates to the minimum of 1.50c., at mill, Pittsburgh. Not much has been sold at the advanced price, but it now represents the bottom of the market.

Structural Material.—The American Bridge Company has taken contracts for new steel buildings in the Chicago District, 5000 to 6000 tons, and the McClintic-Marshall Construction Company has taken about 1000 tons of steel for extensions to buildings, ore and coke bins for the Youngstown Sheet & Tube Company. There is a revival of the story that the Pennsylvania Railroad will build a new Union Depot on the Cathedral site, on Fifth avenue, in this city, and if this project should be put through it will require a huge tonnage in plates and shapes. The scheme is to do away with the tunnel under the city, which contains the tracks of the Panhandle Railroad; the vacating of Grant street from Fifth avenue to Seventh avenue, and the changing of other street lines. The project is a tremendous one, but would be of immense value to the Pennsylvania Railroad, as it would give it downtown terminals, which it needs very badly. Several large structural jobs on which bids went in some time ago are ready to close and are expected to be given out this week. Prices on plain material have been advanced $2 a ton, and we now quote beams and channels up to 15-in. at 1.50c., Pittsburgh, in large lots.

Tin Plate.—The question of importance in the tin plate trade just now is what prices will be named by the American Sheet & Tin Plate Company and the leading independent mills on tin plate for delivery in first quarter and first half of next year. There seems to be no doubt, in view of the higher prices of tin bars and the advances in pig tin, that higher prices on tin plate for delivery next year will be asked, but no information has been given out as to how much of an advance will be made. The American Sheet & Tin Plate Company continues to increase steadily the number of active hot tin mills in the works affected by the strike, and in its three largest plants—The American Works at Ellwood and the New Castle and Shenango works at New Castle—considerably more than half the mills are running. The demand for tin plate is not very heavy, but the mills have a large number of contracts on their books and consumers are specifying freely. Tin plate for spot shipment is scarce, and occasionally slight premiums in prices are paid for prompt delivery. We quote tin plate at $3.40 per base box for 100 lb. cokes, f.o.b. Pittsburgh.

Sheets.—The demand for sheets is very active, and all the leading mills have engagements on their books that will take their entire output for the next six weeks or two months. Some mills are so well filled up that they cannot promise deliveries inside of 90 days from the date of order. Prices are very strong and concessions have about disappeared. Minimum prices on box annealed, one-pass black sheets are 2.20c. for No. 28 and 3.25c. for No. 28, galvanized. Roofing sheets are firm, at $1.55 per square for painted corrugated and $2.80 for galvanized corrugated. 2½-in. corrugations. Jobbers charge the usual advances over these prices for small lots from store.

Bars.—Specifications against contracts are being received by the mills at an unprecedented rate; new orders are coming in very freely, and all the leading steel bar mills are back in deliveries from six weeks to two months or longer. For this reason some business that would ordinarily go to the steel bar mills is now being diverted to the bar iron mills, which are in position to make more prompt deliveries. The new demand for iron bars and specifications against contracts are heavier now than at any time in the past year or more, and the bar iron mills are now able to operate to full capacity. The minimum price of steel bars is 1.40c., and small lots are held at 1.45c. to 1.50c., at mill. We quote iron bars at 1.50c., minimum, at mill, Pittsburgh.

Hoops and Bands.—One or two leading makers have booked some contracts for delivery into next year, while the general demand is heavy. The minimum price of hoops is 1.45c. on large contracts, most makers holding firm at 1.50c. to 1.55c. at mill. Steel bands are firm at 1.35c. to 1.40c. at mill, with steel bar card extras.

Shafting.—Consumers are specifying liberally against contracts for shafting placed some time ago, when discounts were larger than they are now. Fresh orders are numerous. It is stated that the advance in prices, which became effective September 1, is being absolutely held. We quote cold rolled shafting at 57 per cent. off in carloads and 52 per cent. in less than carloads, delivered in base territory, with proportionate advances for delivery in all other territories.

Spikes.—Within the last few days heavy inquiries for spikes have come from some of the leading Western railroads for 1910 delivery, among these being the Great Northern, Rock Island, Illinois Central and Chicago, Burlington & Quincy. Most of the spike makers are refusing to quote on these inquiries on account of the deliveries running through 1910, believing that prices will be higher before next year is reached. There is a good general demand, and all the makers of spikes are running their works full and have a good deal of business on their books. Prices are very firm, and are showing a tendency to advance. We quote railroad spikes, 4½ x 9-16 in. and larger, at $1.70 and for smaller

sizes and boat spikes at $1.75, base, subject to standard card extras, with an advance of 5c. per keg in less than carload lots.

Rivets.—Trade in boiler and structural rivets is active, and all the makers have more orders on their books at present than at any time for more than a year. We are advised that the recent advance of $2 a ton in prices is being firmly maintained. We quote structural rivets, ¾ in. and larger, at 1.80c., base; cone head boiler rivets, ¾ in. and larger, 1.90c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Merchant Pipe.—The new demand continues heavy and is fully equal to or larger than the capacity of the mills to make pipe. Some of the makers are not inclined to accept engagements too far ahead, believing that prices may soon be advanced, in sympathy with raw material, on which prices are much higher now than when the heavy cut in pipe was made last February. The official discount on black steel pipe, ¾ to 6 in., is 81 and 5, and on iron pipe, ¾ to 6 in., 75 and 5, in carload and larger lots to the wholesale trade. These prices are absolutely minimum, jobbers charging the usual advances to the smaller trade for shipment from store.

Boiler Tubes.—Some contracts for locomotive tubes have recently been placed by railroads for delivery up to January 1, and on seamless boiler tubes the mills are behind in deliveries. Official discounts on locomotive and merchant tubes are still being shaded to some extent.

Iron and Steel Scrap.—The situation in the scrap market is very tight at present, and consumers are having some trouble in getting scrap as fast as needed at what they regard as market prices. Dealers who have scrap piled up in their yards are inclined to hold it for a higher market and are declining firm offers at the present level of prices. There is a particularly heavy demand for borings and turnings, and these are being brought from the Chicago District to Pittsburgh. The minimum price of heavy steel scrap is $17.50 per gross ton, for delivery at Monessen, Sharon, Steubenville, Follansbee and Pittsburgh, and reports are that several lots of heavy steel scrap have been sold as high as $18, for delivery at these points. On other grades of scrap dealers quote about as follows: Cast iron borings, $11 to $11.25; No. 1 cast scrap, $16; No. 2, $15; bundled sheet scrap, $15.25 to $15.50; No. 1 railroad malleable, $16 to $16.50; low phosphorus melting stock, $21 to $21.50; sheet bar crop ends, $18.50 to $19; grate bars, $13 to $13.50; steel axles, $21.50 to $22; rerolling rails, delivered Newark, Huntington or Cumberland, $17.50; locomotive tires, $19 to $19.50; locomotive axles, $26 to $26.50; old car wheels, $17.50; machine shop turnings, $13 to $13.25; iron axles, $26 to $26.50; No. 1 busheling scrap, $15; No. 2, $11.50 to $12, and No. 1 railroad wrought scrap, $18 to $18.25. All above prices are per gross ton, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—The furnace coke trade is quite active. Standard grades for prompt shipment and for delivery over the balance of the year are held at about $2.40 per net ton at oven, while other makes of coke not so favorably known can be had as low as $2.25. Best makes of 72-hr. foundry coke are held at $2.50 to $2.60 per net ton at oven, while some grades might be had at slightly lower prices. There is still a scarcity of labor in the Connellsville regions, and some of the plants are also crippled in their operations by lack of water. The output of coke in the Upper and Lower Connellsville regions last week was 421,320 tons, an increase of nearly 5000 tons over the previous week.

Cincinnati.

CINCINNATI, OHIO, September 15, 1909.—(*By Telegraph.*)

In the finished lines, particularly machinery and machine tools, the market shows a steady improvement. The week opened with heavy orders in some special lines of tools, such as drilling machinery, lathes, milling machines, &c., and builders are trying to secure additional skilled help. Jobbing foundries making castings for these concerns are booked up for three and four weeks and are increasing their melts. In old material there is not much actual buying on the part of consumers, but inquiries for scrap for next year are accumulating. Dealers are very firm on prices. Steel bars, shapes and plates are very strong, and those who can make prompt delivery are frequently getting a premium over quoted prices.

Pig Iron.—Steelmaking and foundry irons are in greatest demand this week, and some good sized contracts for next year are under negotiation. The opinion is expressed by leaders in the trade that the $13.50, Birmingham, iron of last week has finally disappeared, and the market to-day on prompt and last quarter iron seems to be rather firm at $14, Birmingham. An independent spirit prevails among Southern ironmakers, and not a few of the producers of standard brands are limiting their acceptance of shipments to special customers at current quotations and restricting next year's deliveries as far as possible to the first quarter. A greater variety of foundry irons is demanded in this week's inquiries, and there are customers for almost every grade manufactured, even to white iron, a couple of cars of which are wanted by a northern Ohio melter. Several hundred tons of ferromanganese are wanted in central territory. For next year this iron is quotable on a basis of $44 to $45, Baltimore, for the first half and $42 to $43 for balance of this year. Northern iron is quotable on the basis of $16, Ironton, for prompt and balance of this year, and $16.50 next year, although the $16 price may be done for the first half also. Silveries are stronger, some good inquiries coming from Chicago and Michigan. Some charcoal iron is wanted in Pittsburgh territory. A sale of 2000 tons of this iron, standard Southern, is noted at $21, Birmingham, deliveries covering eight months, commencing in October. A Michigan consumer has taken 1000 tons of No. 2 foundry at $14, Birmingham, for the first quarter. A local steelmaker is negotiating for 3000 to 5000 tons of basic and 2500 tons of Bessemer for the first quarter. A local foundry has purchased 1000 tons each of Northern and Southern analysis iron for the first half, part of which is rumored to have been bought at a cut price. It is stated that $13.50, Birmingham, was paid for the Southern, and that the Northern was contracted for at around $15.50, Ironton. A Michigan melter is inquiring for 4000 tons of foundry iron for the first half. Inquiries for prices on modest quantities, ranging from a few carloads to 500 and 600 tons, are numerous, largely from Michigan and the Northwest. Southern basic is negotiated on a basis of about $14.50, Birmingham, for the balance of the year and Northern at around $16.50, Valley. For prompt shipment and delivery over the balance of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$17.75
Southern coke, No. 2 foundry	17.25
Southern coke, No. 3 foundry	16.75
Southern coke, No. 4 foundry	16.25
Southern coke, No. 1 soft	17.75
Southern coke, No. 2 soft	17.25
Southern coke, gray forge	16.00
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	17.70
Lake Superior coke, No. 2	17.20
Lake Superior coke, No. 3	16.70
Standard Southern car wheel	$23.25 to 24.75
Lake Superior car wheel	21.50 to 22.00

(*By Mail.*)

Coke.—Some inquiries are in the market for a year's supply of furnace coke; one is for 225 tons per day for one year, another 200 tons a day from October 1 to July 1. Other agencies also report inquiries from furnace companies not yet supplied. Tennessee companies are reported to have contracted last week. Furnace coke for the first half is strong, at $2.25 to $2.50 per net ton, at oven, which includes the Connellsville, Pocahontas and New River product, and some dealers are asking $2.50 to $3 on a year's contract. Because of the rapidly increasing difficulty to get labor at the ovens, dealers are predicting $3 coke by the first of the year. Wise County furnace coke is quotable at about $2.10 to $2.25, at oven, on contract. It is difficult to quote a spot price on coke at this time because of varying conditions in shipments. A little spot foundry may be available to-day at $2 to $2.10 and up to $2.25, at oven. For next year the leading producers are asking $2.50 to $2.75. An inquiry put up to a producer in the Pocahontas District to-day brought out $2.10 as the best that could be done for 30 to 60 days' delivery on foundry coke. There is shown an increasing reluctance on the part of producers to quote for next year's deliveries.

Finished Iron and Steel.—The movement of material on contract is good, and last week saw a wide range of new business from manufacturer and jobber alike. About the best that can be done here on steel bars is 1.40c., Pittsburgh, and 1.50c. on shapes and plates. Deliveries from leading mills are behind from six to eight weeks on shapes, 60 days on bars and three to four weeks on plates. A rich harvest is being garnered by a few of the smaller mills of the Central West and Northwest that can make immediate deliveries on urgent needs by asking and getting a premium of $1 or more a ton. On black and galvanized sheets this is particularly true; for prompt shipment a mill in this district is getting a premium without difficulty.

Old Material.—The scrap market continues strong, but it has developed rather into a dealers' market. Consumers are shying at the rapid advances, and buying has fallen off considerably, although there is still some good business going in Southern shipments of relayers, old car wheels and the like. There is no appreciable change in quotations since last report, and we continue dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. wrought, net ton	$14.50 to $15.00
Cast borings, net ton	8.00 to 8.50
Heavy melting steel scrap, gross ton	15.00 to 15.50
Steel turnings, net ton	9.00 to 9.50
No. 1 cast scrap, net ton	14.00 to 14.50
Burnt scrap, net ton	10.00 to 10.50
Old iron axles, net ton	18.50 to 19.00
Old iron rails, gross ton	15.75 to 16.25
Old steel rails, short, gross ton	14.00 to 14.50
Old steel rails, long, gross ton	15.00 to 15.50
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton	14.50 to 15.50
Low phosphorus scrap, gross ton	14.00 to 14.50

Philadelphia.

PHILADELPHIA, PA., September 14, 1909.

Buying in all branches of the trade continues in good volume, and prices continue to move upward. Deliveries are hardening sharply. Some producers of rolled steel products are practically sold up for the remainder of this year. Pig iron makers are also well sold up, and iron for prompt delivery is scarce. Orders for pig iron continue to be taken for shipment extending over various portions of the first half of next year, prices for which vary considerably, but average about 50c. a ton higher than for this year's delivery. The tone of the whole market is very strong, and the bulk of the business transacted is of a prompt nature, owing largely to the refusal of makers to accept orders for extended shipment.

Pig Iron.—Somewhat more active conditions are noted, both in purchases for this as well as next year's delivery. Basic has again shown more movement, and sales of about 18,000 tons for delivery in the second quarter, as well as several thousand tons for first quarter shipment, are reported, the price being $18, delivered, in both cases. Basic seems to be pretty firmly held at that figure, while several sellers are holding for an advance of 50c. for deliveries in the first half of 1910. Prompt basic is extremely scarce, few, if any, Eastern furnaces having any iron of that grade for this year's delivery. Moderate quantities of Virginia basic are available, however, for early shipment, but sellers hold at $18.50 for such delivery. Foundry grades are being freely inquired for, both for early and forward shipment, and prices show considerable range, dependent upon the condition of sellers' order books. For shipment the balance of this year $18, delivered, now appears to be the minimum for No. 2 X, although sales as high as $18.50 are frequently reported, the higher range being named for the larger contracts, which, under present conditions, sellers deem the less desirable. The same grade of iron for delivery in the first quarter of 1910 ranges from $18.50 to $19, dependent on quantity and other circumstances. While the bulk of the foundry iron transactions have been small individually, several fair sized lots have been sold for early 1910 delivery, at the above named prices. By far the greater proportion of the orders for this year's delivery have been small. Low grade foundry iron, for cast iron pipe making, is in good demand, but is extremely scarce, and consumers have, in instances, taken iron of higher grades. A sale of 1000 tons of No. 3 for shipment this year is reported, at $17, delivered. Virginia foundry iron is not being extensively sold. With the exception of the leading interest, producers have but little to offer for this year. For prompt shipment Virginia No. 2 X is held at $18, delivered in this territory, while a sale of 3000 tons of No. 3 foundry for local consumption, delivered in the first quarter of next year, at $15.25, furnace, is reported. Southern foundry iron shows but little movement; prices are unchanged and offerings by makers are extremely light. Forge iron is comparatively scarce, and prices have advanced, in some cases prohibitive figures being named. A sale of 1000 tons for this year's delivery, at $16.75, delivered, is reported, and represents about the minimum price for that grade. More inquiry for low phosphorus iron is reported, but sellers are holding for somewhat better prices. The advance in the price for this grade has been comparatively small, and higher prices are anticipated in the near future. With prices steadily advancing on practically all grades of pig iron, the possibility of profitable importation becomes of interest. Already cargo lots of Middlesbrough foundry iron have been offered at prices but little above those prevailing for domestic iron. Foreign basic iron has also been offered, but at prices still somewhat higher than those at which domestic basic has been sold. Sellers in this territory, however, are not forcing business, and while small lots are comparatively freely taken at the ruling quotations, large lots are either refused or higher prices are named. For moderate lots, delivered in buyers' yards, eastern Pennsylvania and nearby points, during the remainder of the year, the following range of prices is named, with deliveries extending into the first quarter of 1910 commanding an advance of about 50c. a ton:

Eastern Pennsylvania, No. 2 X foundry	$18.00 to $18.50
Eastern Pennsylvania, No. 2 plain	17.50 to 18.00
Virginia, No. 2 X foundry	18.00 to 18.25
Virginia, No. 2 plain	17.75 to 18.00
Gray forge	16.75 to 17.00
Basic	18.00
Low phosphorus	21.00 to 21.50

Ferromanganese.—The local demand shows no particular activity. Few buyers for round lots are in the market, one sale of 500 tons being the only important transaction reported. For prompt and early 1910 delivery $42, Baltimore, about represents the market for fair sized lots, small quantities commanding somewhat higher figures.

Billets.—A much more active demand is observed. In addition to increased local inquiries, Eastern mills report a demand from the West, and a considerable quantity has been sold for such delivery. Producers here are now pretty well booked up as far as their capacity for the balance of this year is concerned, and have not yet opened their books for next year. Ordinary rolling steel is held firmly at $27.50 for prompt deliveries, extended shipments commanding an advance of about $1 a ton. Forging billets have been in very good demand, and ordinary steel of that grade is firm at $30, Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—Prices show a decided upward tendency, a number of sellers now quoting 1.65c., delivered, for minimum carload lots. On desirable business, however, particularly in sheared plates, 1.60c., delivered, in carload lots, can still be done in some cases. Mills continue to run at full capacity, and orders average up a very satisfactory total, although a little irregularity has developed in the volume of the day to day business. Business for next year's delivery is still refused by the mills, except for specifications on which deliveries necessarily run beyond the year end, but no open contracts are being considered.

Structural Material.—No large orders have recently been placed, although several fair sized lots are being figured on. The volume of small and miscellaneous business keeps up extremely well and some mills are sold up well toward the end of the year. In some classes of material deliveries satisfactory to the buyers are hard to obtain. Prices for fabricated work are hardening considerably, while those for plain material are unchanged but strong at 1.60c. to 1.65c., delivered, dependent on specifications.

Sheets.—A very much better volume of business is coming to the mills. Day to day orders are heavier, while some comparatively large individual orders have also been taken. Prompt sheets are unchanged in price, although forward shipment commands a premium of $1 to $2 a ton, dependent on individual circumstances. Mills are fully engaged, and prices for prompt shipment are firm as follows: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—The tonnage of orders coming out is larger, and prices show an upward movement. Mills are better engaged, although most of them still refuse to accept contracts for forward delivery. Refined iron bars, for reasonably prompt shipment, are quoted at 1.52c. to 1.60c., delivered. Steel bars have been pretty generally moved up to the 1.40c., Pittsburgh, base, equal to 1.55c., delivered here, and some mills are not quoting on small sizes on which they are unable to make deliveries in less than four months.

Coke.—A decided uplifting is observed in the prices named for both furnace and foundry grades. Considerable inquiry has developed for both this and early next year's delivery, and some fair business has been taken at a higher range of prices. Furnace coke for this year's shipment has been sold at $2.10 per net ton at oven, and some makers hold that grade at $2.30 for next year's delivery. Foundry coke for next year's shipment is now pretty generally quoted at $2.50, at oven, while $2.40 has been done for a moderate lot for this year's shipment. Quotations are somewhat irregular, but the following range about represents the range for deliveries in this territory for the balance of the year.

Connellsville furnace coke	$4.25 to $4.40
Foundry coke	4.55 to 4.75
Mountain furnace coke	3.85 to 4.05
Foundry coke	4.15 to 4.35

Old Material.—The market is only fairly active, transactions being closely confined to small lots for prompt shipment. The heavy melting steel situation is unchanged, and developments are being awaited by both buyers and sellers. It looks, however, as if higher prices would have to be paid by the mills if any fresh tonnages are to be brought out, as sellers refuse to let their holdings go at prices the associated mills claim to be willing to pay. The general tone of the market is strong. Prices on the whole show but little change and are largely nominal, the following range about representing the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$17.25 to $17.50
Low phosphorus	21.00 to 21.50
Old steel axles	23.00 to 23.50
Old iron axles	25.50 to 26.00
Old iron rails	20.00 to 21.00
Old car wheels	17.00 to 17.50
Choice No. 1 R. R. wrought	20.00 to 20.50
Machinery cast	15.75 to 16.25
Railroad malleable	15.00 to 16.00
Wrought iron pipe	17.00 to 17.50
No. 1 forge fire scrap	15.00 to 15.50
No. 2 light iron	10.00 to 10.50
Wrought turnings	14.25 to 14.75
Stove plate	13.50 to 14.50
Cast borings	12.25 to 12.75
Grate bars	14.25 to 14.75

The Scott Iron & Steel Company, Heidelburg, near Pittsburgh, manufacturer of steel castings, reports business steadily improving. The foundry recently made an unusual casting, consisting of a steel drive wheel for a coal breaker 13 ft. 3 in. in diameter and weighing 8700 lb.

Cleveland.

CLEVELAND, OHIO, September 14, 1909.

Iron Ore.—Instead of quieting down, as had been expected, the market shows greater activity. One ore firm sold a 25,000-ton lot Monday and another interest reports sales during the week aggregating 50,000 tons. These sales were all of non-Bessemer and nearly all is to go to blast furnaces in the central territory, although a small quantity was sold for Eastern shipment. One furnace interest now has an inquiry out for its requirements, which will amount to about 100,000 tons, and there are a large number of inquiries for small lots. These are mainly from consumers who bought the bulk of their requirements some time ago but who are now in the market for additional ore so as to have a sufficient supply to keep their furnaces running at maximum capacity the next few months. While the ore men do not expect to sell many round lots from now on, the indications are that in the aggregate a considerable quantity will be disposed of during the balance of the season. Ore shipments continue very heavy, and it is expected that the September movement will nearly equal that of August. Plenty of boats are available, but shipments from the mines to Ashland and Escanaba are being delayed by a car shortage. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—Inquiries are plentiful, but only a small tonnage has been sold in this market during the week. Buying has been checked by the advancing prices, and owing to the fact that the majority of the leading producers are refusing to quote for delivery after the first of the year. During the past month the furnacemen have sold considerable foundry iron for next year's delivery, and they are now holding off and waiting developments, believing that higher prices will prevail in a short time. Foundry iron inquiries are mainly for the first quarter and half in lots ranging from 100 to 500 tons. Inquiries are quite general, but they are particularly numerous from New England. The largest foundry inquiry pending is from the American Locomotive Company for 5000 tons for the last quarter. Local furnaces are quoting $17, at furnace, as their minimum price for No. 2 foundry for any delivery. In the Valley prices are firmer, and some interests are now asking $17 to $17.50 for No. 2 for first quarter and first half delivery. For the balance of the year the price ranges from $16 to $16.50, Valley furnace, for No. 2. The latter price now appears to be the minimum for delivery after January 1. Bessemer is very firm, with $17, Valley furnace, as the minimum. There is a disposition among consumers of basic to buy for delivery after the first of the year, but furnacemen do not care to quote that far ahead. Among the inquiries is one for 5000 tons of basic for the first quarter. Basic is quoted at $16, Valley furnace. For the balance of the year, we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern foundry, No. 1	$17.50 to 17.75
Northern foundry, No. 2	17.00 to 17.25
Northern foundry, No. 3	16.50 to 16.75
Southern foundry, No. 2	18.35
Gray forge	15.75 to 16.00
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—The scarcity of labor in the Connellsville region continues and some producers are behind on deliveries. Spot furnace coke is scarce. Prices are very firm. A local interest that has just contracted for a small lot for delivery after the first of the year was unable to secure any quotations under $2.50 per net ton, at oven, for standard Connellsville coke. We quote the same grade at $2.25 to $2.50 for spot shipment and balance of the year. Some foundry coke contracts have been closed during the week. For spot shipment we quote standard 72-hr. foundry coke at $2.50 per net ton, at oven. For the first half producers are asking from $2.65 to $3.

Finished Iron and Steel.—The demand continues heavy in all lines, and a number of mills are getting further behind on deliveries. Following the announcement by the leading interest last week of an advance to 1.50c., Pittsburgh, on plates and structural material, other mill agencies have made a similar advance, and that is now quoted as the regular price. Local plate mills have made a similar advance to conform with the new Pittsburgh price. The demand for plates is heavy and local mills are well filled up. The announcement of the placing of orders for more lake boats is expected soon. In structural material an inquiry has developed for 1000 tons for a local manufacturing plant. Consumers of steel bars and structural material are still seeking to make contracts for delivery after the first of the year, but only a few have been made, nearly all of the mills refusing. The leading interest is taking some steel bar contracts for delivery to the end of the year at the 1.40c. price and is notifying consumers that contracts that expire October 1, on which full specifications have not been received, will be canceled on that date. Mills able to make prompt deliveries on plates and shapes are getting $2 a ton premium for small lots for prompt shipment. The demand for iron bars has become quite heavy and local mills are now well filled. An Indiana mill has taken some orders in Ohio during the week at 1.40c., but local mills are now quoting 1.50c., Pittsburgh. The demand for sheets continues very good and regular prices are being firmly maintained. Some of the mills are now so well filled that deliveries are not promised within a month or longer. There is a fairly good demand for forging billets in carload lots. Warehouse business continues very heavy. Jobbers announce an advance in stock prices on steel bars to 1.80c. and on structural material to from 1.90c. to 2c.

Old Material.—The market is quite active. Heavy melting steel has been slightly easier, owing to the fact that local mills were not in the market, but dealers report the sale of considerable tonnage in small lots for Pittsburgh and Sharon delivery at $17 to $17.25, delivered. The demand for cast scrap continues good, and a large volume of inquiries have come in from out of town foundries. There is somewhat of a scarcity in machine cast scrap. Yard dealers are in the market for scrap to increase their stocks, but find that country dealers are holding for better prices, and only a limited tonnage can be picked up. The Norfolk & Western Railroad will close September 21 on a list of about 1500 tons. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$16.00 to $16.50
Old iron rails	18.00 to 18.50
Steel car axles	19.00 to 19.50
Old car wheels	16.00 to 16.50
Heavy melting steel	15.50 to 16.00
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	14.00 to 14.50
Railroad malleable	16.00 to 16.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$20.00 to $20.50
Cast borings	8.00 to 8.50
Iron and steel turnings and drillings	10.00 to 10.50
Steel axle turnings	11.50 to 12.00
No. 1 busheling	13.50 to 14.00
No. 1 railroad wrought	15.00 to 15.50
No. 1 cast	14.00 to 14.50
Stove plate	12.00 to 12.50
Bundled tin scrap	10.50 to 11.00

St. Louis.

ST. LOUIS, September 13, 1909.

While a slight degree of apprehension was discernible regarding the effect on general business of the action of the stock market in consequence of the demise of probably the greatest railroad genius of the country, it soon passed, when at the close of the week it was seen that no serious disturbance need be looked for. Inquiry among various leading representative business houses discloses a steady increase of trade and a growing confidence in the stability and permanent character of the improvement. We fail to find any complaint of lack of demand in any line of staple goods. Interest in the direction of utilizing the Mississippi River for freighting purposes, through the use of tow boats and barges adapted to present conditions, is rapidly developing and steps are being taken toward organizing a company with large capital to inaugurate river service between St. Louis and New Orleans. This movement has the indorsement and support of all the great business associations of the city and a large traffic of a miscellaneous character is assured the enterprise. According to the statements September 1 of the financial institutions doing three-fourths of St. Louis' business, their resources of cash were $307,413,989; of exchange, $87,106,968.

Coke.—A marked improvement is observed in the interest taken in the coke market, with indications of more activity obtaining in the near future on the part of important consumers, but at present there are no large inquiries to report. Some business is passing, but it is coming from the class that buy merely for current needs. There is also a fair number of requisitions on contract being received. The leading sellers note the firmer views and advance of prices on the part of producers, but the situation, so far as buyers are concerned, remains rather tame. A large smelter is in the market for 500 tons for quick shipment, 2000 tons for shipment over the balance of the year and 6000 tons for shipment over the first half of 1910. There is some irregularity in quotations, owing to the fact that in one or more cases intimations are made that, on firm offers, some business might be worked at, but a small advance over the figures for the opening of the month. In a general way prices asked by the leading sales agencies may be named as follows: For 72-hr. standard foundry grade, prompt shipment, $2.35; for shipment over the balance of the year, $2.35; for shipment over the first half of 1910, $2.65, f.o.b. oven, Connellsville. The more urgent demand for furnace coke and its appreciation in price are factors in the strength exhibited in foundry coke and make for higher prices in the near future.

Pig Iron.—While the market continues strong, with a good demand from small and medium buyers, but few large consumers are making inquiry and even a part of such in-

quiries are merely for keeping posted. The explanation for the quiet market is doubtless owing to heavy buying during the advancing prices of the last of May and first of June and to the material advance which has taken place. A leading house reports a sale of 5000 tons of local iron to a foundry. The representative of a large Southern producer reports sales for the week of 3300 tons for last half and first quarter, of which 600 tons was No. 1 soft, for prompt shipment. A feature of the present situation is the narrowing of offerings on the market and it would appear that strictly commission selling is subject to confirmation as to quantity, even on the basis of asking prices. So far as we can learn, there are no offerings for the second quarter of 1910. For the balance of this year and first quarter of 1910 the quoted price at all the principal offices for Southern No. 2 foundry is $14, Birmingham. Some brokers report overtures being made for cash business in preference to deferred deliveries on the part of furnacemen. Virginia iron is held at $15, at furnace, for the balance of the year and $16 for the first half of 1910.

Lead, Spelter, Etc.—Lead is quiet at 4.25c., East St. Louis. Spelter is weak at 5.67½c., and the market is featureless. Zinc ore is held at $48 per ton, Joplin base. Tin is off ¼c.; antimony unchanged from last week; copper unchanged. The demand for finished metals continues good.

Old Materials.—The demand for scrap iron and steel is becoming more urgent and general. The leading dealers report business good and prices very strong, though steady and unchanged from last week. The only list on the market is that of the Wabash Railroad, 400 tons. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft	15.75 to 16.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	17.00 to 17.50
Heavy melting steel scrap	16.00 to 16.50
Frogs, switches and guards, cut apart	16.00 to 16.50

The following quotations are per net ton:

Iron fish plates	$13.75 to $14.25
Iron car axles	20.50 to 21.00
No. 1 railroad wrought	15.25 to 15.75
No. 2 railroad wrought	14.25 to 14.75
Railway springs	13.75 to 14.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	7.50 to 8.00
No. 1 boilers, cut to sheets and rings	11.00 to 11.50
No. 1 cast scrap	13.50 to 14.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.00 to 12.50
Pipes and flues	11.00 to 11.50
Railroad sheet and tank scrap	10.50 to 11.00
Railroad grate bars	10.75 to 11.25
Machine shop turnings	9.50 to 10.00

The Mt. Vernon (Ill.) Car Mfg. Company has broken ground for its new steel car plant, which represents an investment of over $1,000,000.

A new union passenger station is to be built at Kansas City within four years. Its cost of over $4,000,000 is to be provided at the rate of $1,000,000 each year. The main building will be 166 x 515 ft. Its shape is that of a T and the structure will be four stories in hight. The ordinance authorizing the station calls for the expenditure of $20,000,000 for increased trackage in and out of the city and for the building of viaducts and subways. Gavis Hunt, Chicago, is the architect.

Buffalo.

BUFFALO, N. Y., September 14, 1909.

Pig Iron.—The market is very strong, with a tendency toward higher values. Sales, although not quite as heavy as for the past two weeks, continue large and inquiries aggregating 25,000 to 30,000 tons have been received for first quarter and half deliveries, mainly foundry iron. The present local demand for malleable is not active, but malleable shops in central and eastern New York are becoming busier and inquiries from that section are more numerous. There has been an increased inquiry for basic, with a number of good sales, principally in eastern Pennsylvania, and prices have strengthened materially. We quote as follows for balance of the year and first quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	$16.50 to $17.00
No. 2 X foundry	16.25 to 16.75
No. 2 plain	15.75 to 16.25
No. 3 foundry	15.50 to 15.75
Gray forge	15.25 to 15.50
Malleable Bessemer	16.25 to 16.75
Basic	17.00 to 17.50
Charcoal	19.50 to 20.00

Finished Iron and Steel.—The principal interest and all independents have now advanced prices for steel bars to 1.40c., and for plates and shapes to 1.50c., Pittsburgh. These prices in most instances are good only until December 31. Business continues very active in general lines. In structural material large orders are being booked at the advanced prices. In a good many mills deliveries on steel bars cannot now be made in less than three to four months for small sizes, ¾ in. and under, and six to eight weeks for plates and shapes. In structural lines no new work has come up locally for bids, but specifications will be out shortly for several new factory and commercial buildings. Local fabricators and erectors are, however, extremely busy on a large number of buildings now in course of construction. A prominent Canadian fabricator has this week placed an order with the agency for the leading interest here for 5000 tons of structural material. There is great activity in building operations in Toronto and other Canadian cities, and a good deal of railroad bridge work is also in progress in Canadian territory.

Old Material.—The market is very strong all round. Sales are numerous and a large aggregate tonnage is being made. There is an active demand for all grades, with the possible exception of heavy melting steel, for which there is no local inquiry at present. The lack of local demand on this item has been offset in a measure, however, by requisitions from outside points. There has been a strengthening of prices in all lines and some advances. We quote dealers' prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$16.50 to $17.00
Low phosphorus steel	21.00 to 21.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 railroad and machinery cast scrap	15.50 to 16.00
Old steel axles	20.00 to 21.00
Old iron axles	23.50 to 24.00
Old car wheels	17.00 to 17.50
Railroad malleable	16.00 to 16.50
Boiler plate	14.50 to 15.00
Locomotive grate bars	12.50 to 13.00
Pipe	13.00 to 13.50
Wrought iron and soft steel turnings	10.75 to 11.25
Clean cast iron borings	8.75 to 9.25
No. 1 busheling scrap	14.00 to 14.50

The Colorado Fuel & Iron Company's Good Showing.

The Boston *News Bureau* says: The net earnings of the Colorado Fuel & Iron Company for the fiscal year ended June 30 last made the best showing of any year since 1906 and, with the exception of two years, recorded the largest balance for dividends after paying about $2,€00,000 for interest, taxes and sinking fund charges, of any year since the organization of the company. The actual balance for dividends was about $€00,000, which compares with less than $300,000 the year before and a deficit after charges no longer ago than 1905. Some interests close to the management profess to see plans on foot for the retirement of the preferred. There is but $2,000,000 of this issue outstanding on which accrued dividends now total approximately 50 per cent. Some interests in New York are understood to have accumulated fully half the preferred at prices ranging up to par. Even if the other half of the preferred is acquired at prices above par, the company stands in a position to save at least $500,000 in back dividends on the approximately 50 per cent. already corralled.

At the present time the Colorado Company is operating its steel department at about 85 per cent. of full capacity. Its coal business is rather unsatisfactory. A director of the company says: "I am confident that the Colorado Fuel & Iron Company has at last turned the corner. We have expended millions in physical equipment and have a plant at last that is prepared to produce steel products at nearly the maximum of operating economy. It is from this source rather than any large gain in gross that our increased profits for the next few years are assured."

The Tidewater Steel Works Sold.—The property of the Tidewater Steel Company, Chester, Pa., was sold at a receivers' sale in that city September 14. Daniel M. Coffin, New York, was the purchaser; the price paid was $305,100, which is $85,000 above the appraisement. The sale, it is believed, will be confirmed by the court. A report that the purchaser, who is a broker, represented the Bethlehem Steel Company or Charles M. Schwab, has been denied at Bethlehem.

At a meeting of the Board of Directors of the Carnegie Steel Company, held September 13, Azor R. Hunt, general superintendent of the Homestead Steel Works, was elected a member of the board to fill the vacancy caused by the death of William H. Singer.

New York.

NEW YORK, September 15, 1909.

Pig Iron.—The market has been quite active locally, although no specially interesting transactions are reported. Sellers are firm, and many of the leading makers ask higher prices, notably for delivery next year. In New England a rather unusual amount of Virginia iron has been marketed for prompt delivery. We quote Northern No. 1 foundry, $18.50 to $19; No. 2 foundry, $18 to $18.50, and No. 2 plain, $17.50 to $18, tidewater, for delivery during 1909 and the first quarter of 1910. Alabama iron is quoted on the basis of $18 to $18.25 for No. 2 foundry, New York.

Steel Rails.—The week has brought announcements of some good sized rail orders for 1910, and of considerable business for this year. In the former class are contracts taken by the Illinois Steel Company for Gary and South Chicago, amounting to 90,000 tons, by the Tennessee Company for 85,000 tons, and by the Carnegie Steel Company for 20,000 tons. Of the Western business 40,000 tons is for the Harriman lines, which also placed 20,000 tons of the Tennessee Company business. The remainder of the Ensley mill's 85,000 tons is made up of 25,000 tons for the 'Frisco system, 30,000 tons for the Louisville & Nashville, and 10,000 tons for the Atlantic Coast Line. The 20,000 tons taken by the Carnegie Steel Company was for a single system. The Lackawanna Steel Company has booked the following orders for this year's delivery, the greater portion being ferrotitanium Bessemer rails; Northern Pacific, 20,000 tons; Great Northern, 2000 tons; Lake Shore, 5000 tons; Wabash, 2500 tons; Chicago & Alton, 1000 tons; Burlington, 5000 tons; St. Paul, 5000 tons. The requirements of the Vanderbilt roads for 1910 are reported to be heavy, and will include a large block of ferrotitanium rails for the New York Central. A Missouri trolley line—a project, thus far, known as the Joplin, Neosho & Springfield—is inquiring for 16,000 tons of T-rails.

Structural Material.—New construction is quieting down, the principal pressure now being to get deliveries so that many buildings now under way may be closed in before winter. The indications are that for some weeks the estimating departments of fabricating companies will have a let-up. Then the railroad and building work of 1910 will begin to come up. A number of railroads have been making up schedules, which it is expected will be heard from by November. Among these are the Pennsylvania, the Baltimore & Ohio, and in the West a number of lines, including the Northwestern and the St. Paul. Recent railroad awards include 1300 tons of bridges for Indiana on the Pennsylvania lines West, and 450 tons of bridges for the Franklin & Clearfield, the latter going to McClintic-Marshall Construction Company. The Erie will contract for a rolling lift bridge on its Mahoning Division, calling for 1500 to 2000 tons. At Buffalo three contracts have been awarded, calling for about 2200 tons—a pumping station, 1200 tons; a warehouse for W. H. Granger & Co., 550 tons, let to H. C. Hanower, and an addition to the Buffalo Realty Company Building, 450 tons, let to the Buffalo Structural Steel Company. Another textile mill contract has been awarded—a building for the Ayer Mills, Lawrence, Mass., taken by the Jones & Laughlin Steel Company, about 1500 tons. At Philadelphia the sheet piling for the Curtis Building, 500 tons, was awarded to the Lackawanna Steel Company. In the East the prices made on fabricating contracts continue to be out of line with those in the West and Central West, being based apparently on prices $5 to $6 a ton less than those maintained in the districts named. We quote plain material on the basis of 1.61c. to 1.66c., tidewater, for beams and channels up to 15 in.

Ferroalloys.—The good demand for ferromanganese has tended to stiffen prices somewhat, and in response to inquiries now in the market, which are still plentiful, sellers are quoting ferromanganese at $44 for this year's delivery. The demand for ferrosilicon is not particularly good. Sellers are asking from $62 to $63, New York. One sale of 200 tons for delivery over the first half of next year is reported at $62.50, delivered in New York.

Bars.—Better conditions are observed in the bar iron trade. The demand is stronger and current orders are somewhat larger, among them being 1000-ton contracts. Eastern manufacturers quote 1.55c., tidewater, on ordinary bar iron and 1.60c. to 1.65c., tidewater, on refined and test bars. Steel bars are quoted at 1.56c. to 1.61c., tidewater.

Cast Iron Pipe.—New York City will open bids from contractors to-day on water extension work requiring 1700 tons of 6 to 12 in. pipe and 100 tons of special castings. Bids will also shortly be opened for another contract which will take about 1400 tons of 6 to 12 in. pipe and 100 tons of special castings. Lodi, N. J., will open bids September 20 for the construction and installation of a water supply system which will require about 700 tons of 4 to 18 in. pipe, 87 fire hydrants and 170 gate valves. Considerable activity is observed in orders for small lots for ordinary extensions for delivery this fall. Pipe founders are becoming more confident as to the future, and a general disposition is shown to ask higher prices. Quotations on carload lots of 6-in., per net ton, at tidewater, are now $24.50 to $25.50.

Old Material.—The principal topic of discussion in the trade is the price likely to be realized by the Isthmian Canal Commission, the purchasing agent of which will open at Washington, on Thursday, September 16, bids on a very large quantity of iron and steel scrap, which is officially put at 45,000 to 125,000 tons, but as reported in other quarters may amount to as much as 140,000 tons. The scrap has been accumulated from the old dredges and other machinery and supplies which were assembled on the Isthmus by the former French owners of the canal. The price bid will be f.o.b. New York harbor, as the United States Government will bring the scrap up in its own vessels, the deliveries to be made at the rate of 1000 tons a week. As the successful bidder is required to deposit security to the extent of $50,000 for the performance of the contract, dealers of most substantial character are the only ones likely to endeavor to secure this contract, which is one of the largest ever made for old material. The deliveries will be spread over nearly three years, and the risk of market vicissitudes will militate against the naming of a high price. The market has been fairly active in all grades of old material, with steel scrap still in the lead in point of interest. The rolling mills are good buyers, and the foundries show by their purchases that they are getting more busy. Prices are now close to the point at which dealers who have been holding scrap for a long time are likely to begin to unload. Quotations are as follows, per gross ton, New York and vicinity:

Rerolling rails	$16.50 to $17.00
Old girder and T rails for melting	15.25 to 15.75
Heavy melting steel scrap	15.25 to 15.75
Relaying rails	22.50 to 23.00
Standard hammered iron car axles	23.00 to 23.50
Old steel car axles	20.50 to 21.00
No. 1 railroad wrought	17.25 to 17.75
Wrought iron track scrap	15.50 to 16.00
No. 1 yard wrought, long	15.50 to 16.00
No. 1 yard wrought, short	14.50 to 15.00
Light iron	9.50 to 10.00
Cast borings	9.50 to 10.00
Wrought turnings	12.00 to 12.50
Wrought pipe	14.50 to 15.00
Old car wheels	15.50 to 16.00
No. 1 heavy cast, broken up	14.50 to 15.00
Stove plate	12.50 to 13.00
Locomotive grate bars	12.50 to 13.00
Malleable cast	15.50 to 16.00

Metal Market.

NEW YORK, September 15, 1909.

Copper.—The two brands of lake copper bought up at resale in New York two weeks ago are still being freely offered at 13c. and some of it is said to have been sold at slightly under that figure. Regardless of the special inducements being offered to buyers, they are not in the market and the situation is very dull. These resale offers have tended to weaken other prices, and some impatient ones who until recently had been holding lake copper at 13.50c. have been quoting under that figure. As a rule, however, the larger sellers are holding firmly for the better known brands, and 13.50c. for lake is the general market price. Electrolytic copper is weak and it can be had in good quantities for 13c. The report of the Copper Producers' Association, published September 10, seemed something of a surprise to many in the trade who did not look for such a large addition to stocks. Exports of copper continue light and so far this month 6806 tons went abroad. L. Vogelstein & Co. furnish the following figures of German consumption of foreign copper for the months of January to July, 1909: Imports of copper, 94,681 tons; exports of copper, 4512 tons; consumption of copper, 90,169 tons, as compared with consumption during the same period in 1908 of 89,819 tons. Of this quantity, 86,813 tons were imported from the United States. In London to-day spot copper brought £58 12s. 6d., and futures, £59 10s. The market was firm.

Pig Tin.—It is very evident that speculative interests here and in London are keeping down the price of pig tin, and buyers have been frightened out of the market because they feel that the metal will go still lower. In consequence the transactions of the week were very few and those only in small lots. Those who desire to do business are inclined to take a gloomy view of the situation and they complain that as soon as they manage to get the price beyond 30c. the speculators step in and pound it down again. Prices established during the week are as follows:

	Cents.
September 8	29.25
September 9	30.00
September 10	30.10
September 13	30.00
September 14	29.90

A sale of tin was recorded in New York to-day at 29.90c. In London to-day the market was firm and prices established were as follows: Spot, £136 5s.; futures, £137 7s. 6d. The arrivals of tin for the month are 1571 tons and there are about 2381 tons afloat. The sales in the London market to-day were: Spot, 200 tons, and futures, 200 tons.

Lead.—Lead has weakened, and there are reports of sales at 4.37½c., although some of the outside interests continue to keep their price up to that established by the American Smelting & Refining Company, which continues to mar-

ket it at 4.40c. The St. Louis market is ragged, and we hear of sales there at 4.25c. In London lead is selling at £12 13s. 9d., which is the same price it was bringing last week. The market there is very dull.

Tin Plates.—The demand for tin plates has fallen off sufficiently to make it very apparent that the price will not be advanced for the present. Some of the independent mills that were demanding a premium for early delivery have modified their stipulations. The price continues to be $3.64 for 100-lb. IC coke plates.

Spelter.—Although there are published reports of sales of spelter at from 5.75c. to 5.80c., we are unable to establish any sales at that figure and parties in the trade who desire to obtain the metal and have looked about to make a transaction at that price have been disappointed. We find the market firm at 5.85c., although the metal is not in good demand.

Antimony.—The market is featureless. We quote Hallett's at 8.37½c. and Cookson's at 8.62½c. and there is plenty on hand.

Old Metals.—The following dealers' selling prices represent the New York market, most of the current business being done at the inside figures:

	Cents.
Copper, heavy cut and crucible	12.75 to 13.00
Copper, heavy and wire	12.25 to 12.50
Copper, light and bottoms	11.50 to 11.75
Brass, heavy	9.00 to 9.25
Brass, light	7.25 to 7.50
Heavy machine composition	11.75 to 12.00
Clean brass turnings	8.25 to 8.50
Composition turnings	9.50 to 9.75
Lead, heavy	4.20 to 4.25
Lead, tea	3.90 to 3.95
Zinc scrap	4.15 to 4.25

Iron and Industrial Stocks.

NEW YORK, September 15, 1909.

The stock market, contrary to expectations, was not adversely affected by Mr. Harriman's death on Thursday. Prices rose rapidly on Friday, and a new high record was made for United States Steel common. Other iron and industrial stocks were also firmly held, and most of them showed an advancing tendency. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	14⅝- 15⅜	Railway Spr., com	47¾- 49⅞
Allis-Chalm., pref.	50⅛- 52¼	Republic, com	37 - 39
Beth. Steel, com.	32 - 34½	Republic, pref.	103 -106⅞
Beth. Steel, pref.	67 - 69½	South. I. & S., com.	19 - 19¼
Can, com	12 - 12¾	South. I. & S., pref.	52 - 54¾
Can, pref	82½- 84	Sloss, com	83¼- 85½
Car & Fdry, com.	66 -*68	Sloss, pref	119¾
Car & Fdry, pref.	118 -*119¾	Pipe, com	31½- 32
Steel Foundries	56½- 59	Pipe, pref	83½
Colorado Fuel	41⅞- 44¼	U. S. Steel, com	75¾ -*80⅝
General Electric	163¾-166¾	U. S. Steel, pref.	123⅝-126¾
Gr. N. ore cert	79¼- 82	Westinghouse Elec.	84½- 85½
Int. Harv., com	88	Chi. Pneu. Tool	31½- 33¼
Int. Harv., pref.	119⅝-120	Am. Ship, pref	112
Int. Pump, com	45⅝- 49	Cambria Steel	42⅝- 44⅞
Int. Pump, pref.	88¼- 88⅞	Lake Sup. Corp	26¼- 27¾
Locomotive, com.	57 - 59¾	Penn. Steel, pref.	116
Locomotive, pref.	114½-115	Warwick	9⅝- 10¼
Nat. En. & St., com.	18 - 18¾	Crucible Steel, com.	13⅞- 14¼
Pressed St., com	47 - 49⅞	Crucible Steel, pref.	80½- 83
Pressed St., pref.	107 -107½	Harb.-W. Ref., com.	29½- 29¾

* Ex dividend.

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 81⅛, preferred 126½, bonds 106¾; Car & Foundry common 68⅞, preferred 118⅝; Locomotive common 60, preferred 115; Steel Foundries 60; Colorado Fuel 45¼; Pressed Steel common 50, preferred 107; Railway Spring common 51; Republic common 39¼, preferred 106¼; Sloss-Sheffield common 88½; Cast Iron Pipe common 32⅛, preferred 84; Can common 12½, preferred 83¾.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, furnish the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926	88¾	89
Bethlehem Steel purchase money 6s, August, 1998	..	117
Buffalo Iron 5s, October, 1925	..	100
Buffalo & Susquehanna 1st 5s, June, 1932	99¾	..
Buffalo & Susquehanna deb. 5s, January, 1926	94	..
Dominion Iron & Steel 5s, July, 1929	97	98
La Belle Iron 1st 6s, December, 1923	..	..
Lackawanna Steel 1st 5s, April, 1923	98⅞	99⅛
Maryland Steel 1st 5s, February, 1922	102	103
Pennsylvania Steel 1st 5s, November, 1917	102	103
Pennsylvania & Maryland Steel 6s, September, 1925	..	111
Republic Iron & Steel 1st 5s, October, 1934	100⅞	102
Sloss Iron & Steel 1st 6s, February, 1920	107	108
Sloss Iron & Steel consol. 4½s, April, 1918	95	97
Jones & Laughlin 1st 5s, May, 1939	102¼	102¾
United States Steel Corporation.		
Collateral Trust 5s, Series A, C, E, April, 1951	114⅝	115¼
Collateral Trust 5s, Series B, D, F, April, 1951	114⅝	115¼
Sinking Fund 5s, April, 1963	106½	106¾
Union Steel 1st 5s, December, 1952	105	105½
Clairton Steel 5s, 1908-1913	101	..
St. Clair Furnace 1st 5s, 1910-1939	101	..
St. Clair Steel 1st 5s, 1908-1926	101	..
Illinois Steel deb. 5s, January, 1910	100	..
Illinois Steel 5s, April, 1913	100¼	101

All bonds quoted "and interest."

Dividends.—The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

The Westinghouse Air Brake Company has declared the regular quarterly dividend of 2½ per cent. and an extra dividend of 1½ per cent., payable October 9.

The New Carnegie Card of Steel Extras.

The Carnegie Steel Company has issued circulars giving its new rates on the standard classification of extras on steel bars and shapes, effective September 1. These rates are effective as stated; in other words, are net and not subject to any discount or reduction. Below are given the new rates on a few of the sizes under each heading for the purpose of showing the basis on which the changes have been made, as those who are interested can obtain copies of the complete card from the company or its selling representatives:

Rounds and Squares.

¾ to 3 1-16 in.	base
⅝ to 11-16 in.	.05c. extra
½ to 9-16 in.	.10c. extra
7-16 in.	.20c. extra
⅜ in.	.25c. extra

Channels.

1½ in. and wider, but under 3 in., x 3-16 in. and heavier	.10c. extra
1½ in. and wider, but under 3 in., x ⅛ in.	.15c. extra
1 to 1¼ in. x 3-16 in. and heavier	.15c. extra
1 to 1¼ in. x ⅛ in.	.20c. extra

Angles.

1½ x 1½ in. and wider, but under 3 in. x 3-16 in. and heavier	.10c. extra
1½ x 1½ in. and wider, but under 3 in. x ⅛ in.	.15c. extra
1 x 1 to 1¼ x 1¼ in., x 3-16 in. and heavier	.15c. extra
1 x 1 to 1¼ x 1¼ in., x ⅛ in.	.20c. extra

Tees.

1½ x 1½ in. and wider, but under 3 in., x ¼ in. and heavier	.10c. extra
1½ x 1½ in. and wider, but under 3 in., x 3-16 in.	.20c. extra
1½ x 1½ in. x ⅛ in.	.25c. extra
1¼ x 1¼ in. x ¼ in. and heavier	.20c. extra

Hexagons.

¾ to 2½ in.	15c. extra
⅝ to 11-16 in.	.25c. extra
½ to 9-16 in.	.35c. extra
7-16 in.	.55c. extra

Ovals.

¾ to 1¾ in.	.15c. extra
⅝ to 11-16 in.	.25c. extra
9-16 in.	.30c. extra
½ in.	.40c. extra

Half Ovals and Half Rounds.

⅞ to 4 in. x 7-32 in. and thicker	.25c. extra
⅞ to 4 in. x Nos. 7, 8, 9 and 3-16 in.	.35c. extra
⅞ to 4 in. x Nos. 10, 11, 12 and ⅛ in.	.50c. extra
¾ in. to 13-16 in. x 3-16 in. and thicker	.40c. extra
¾ in. to 13-16 in. x Nos. 10, 11, 12 and ⅛ in.	.60c. extra

Light Bars and Bands.

1½ to 6 in. x Nos. 7, 8, 9 and 3-16 in.	.20c. extra
1½ to 6 in. x Nos. 10, 11, 12 and ⅛ in.	.30c. extra
1 to 1 7-16 in. x Nos. 7, 8, 9 and 3-16 in.	.25c. extra
1 to 1 7-16 in. x Nos. 10, 11, 12 and ⅛ in.	.35c. extra
13-16 in. to 15-16 in. x Nos. 7, 8, 9 and 3-16 in.	.35c. extra
13-16 in. to 15-16 in. x Nos. 10, 11, 12 and ⅛ in.	.40c. extra

Flat Bars and Heavy Bands.

1 to 6 in. x ⅜ to 1 in.	base
1 to 6 in. x ¼ to 5-16 in.	.10c. extra
11-16 to 15-16 in. x ⅜ to ¾ in.	.20c. extra
11-16 to 15-16 in. x ¼ to 5-16 in.	.25c. extra
9-16 in. to ⅝ in. x ⅜ to ½ in.	.25c. extra

Imports of Swedish Iron Ore.—Of the 200,000 tons of Swedish ore sold some months ago for delivery in the United States in 1909, a considerable portion is going to furnaces in the Schuylkill Valley, Pennsylvania, including shipments of both Gellivare and Kirunavara ores. The Gellivare C ore, of which a considerable quantity is now being delivered, runs 67.50 per cent. in iron and 0.1 to 0.2 in phosphorus. There is also coming in some of the Gellivare D ore, containing 61 to 64 per cent. metallic iron and about 1 per cent. phosphorus. The Kirunavara ore carries 68 to 68.5 metallic iron and 0.1 to 0.2 phosphorus. Most of these ores now come from Lulea, the northeast corner of the Gulf of Bothnia, but after the close of navigation at that port in October shipments will be made from Narvik, in Norway, on the Atlantic coast. The gulf stream keeps this harbor open the entire year. The owners of the Gellivare and Kirunavara mines, from which shipments are now being made to the United States, expect to have 400,000 tons of the ore to offer for sale in the United States for next year, but thus far have not closed any contracts for such deliveries.

Labor Notes.

At Newark, Ohio, two machinists who went out on a strike from the Baltimore & Ohio shops in May of this year were convicted last week of assault and battery and sentenced to 60 days in jail and a fine of $50 each. The charge was brought by men who were at work as strike breakers. Some time ago the Baltimore & Ohio Railroad secured injunctions in Ohio, West Virginia and Pennsylvania restraining the striking machinists from molesting its workmen. The case mentioned is the first prosecution under the injunction.

One of the branches of the National Metal Trades Association reports 994 applications for employment in the three months ending with August. The number of men sent out to employers was 299, and of this number 100 were reported hired. While a great many men are looking for work, it is found that the more skillful mechanics are generally employed and that there is difficulty in getting high grade men.

It is reported that nine out of 19 lodges of the International Association of Machinists, District No. 15, taking in New York City and vicinity, have seceded. The district officers of the seceders claim that they were chosen officers of District 15 at a recent election, though declared defeated, and they will seek recognition from the national officers as real heads of District 15. It is stated that the seceding lodges are opposed to the demand made some time ago by District 15 for the closed shop and a new wage scale and that therefore it cannot be enforced.

It is announced at Washington that the Department of Justice will pay no further attention to the situation in the plant of the Pressed Steel Car Company at McKees Rocks, Pa. The United States District Attorney at Pittsburgh and the special agent who recently investigated the charges against the company, reported that neither the laws against peonage nor the laws regulating immigration had been violated. Instances of brutality to the foreigners were cited, but no specific violation of law justifying prosecution was found.

The strike at the sheet mill plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, which started July 1 on account of the refusal of the company to sign the Amalgamated Association's sheet mill scale, is over, all six of the hot sheet mills now being in full operation and manned by thoroughly competent men. In fact, the company has more applications for work from skilled sheet mill men than it can fill.

The Fraser Lock Bar Pipe Company.

A charter was granted September 4 to the Fraser Lock Bar Pipe Company by the State of New Jersey to have a capitalization of $500,000 and to have power to manufacture and sell lock bar and riveted pipe and to buy, sell and manufacture or deal in anything pertaining to or requisite in the development of this business. This company is formed through a contract entered into between John Fraser, C. J. McDowall, George P. Bard, R. T. McCormick and A. W. Krouse, to operate on the basis of the patents granted and to be granted to John Fraser and Thomas Gray, for machinery for manufacturing lock bar pipe. The company will be prepared to make standard lock bar pipe in any diameter from 20 to 84 in., in 30-ft. lengths, and will also be in the market for contracts for riveted pipe of any diameter.

The headquarters of this company are now at room 1774, 50 Church street, New York City, where the Eastern manager of the Petroleum Iron Works Company, George P. Bard, is located. It is the intention to have the plant of the utmost efficiency for this work and work is now progressing on the plans for the buildings and machinery under the direction of John Fraser, and bids will be called for on complete plant and equipment. The construction will be pushed rapidly, as it is desired by all concerned to begin the manufacture of pipe as soon as possible. John Fraser is well known to the trade as a mechanical engineer of long experience in steel works and as having been general manager of the only company now making lock bar pipe in America, the successful development of this pipe in the United States having been under his management. His associates are well known through their connection with the Petroleum Iron Works Company, whose works are located at Sharon, Pa.

Copper Production and Stocks.

According to the Copper Producers' Association figures for August, deliveries by the country's copper companies fell to the smallest figure since last March, while the output rose to the highest volume on record. Following are the August returns, compared with those of July and June, figures representing pounds:

	August.	July.	June.
Stocks	122,596,607	154,858,061	169,848,141
Production	120,597,234	118,277,603	116,567,493
Totals	243,193,841	273,135,664	286,415,634
Deliveries	107,996,991	150,539,057	131,557,573
Stocks remaining	135,196,930	122,596,607	154,858,061
Month's decline	.....	32,261,454	14,990,080
Month's increase	12,600,323	.....	.....

The following table shows production, deliveries and stocks for each month so far this year, figures being in pounds:

	Production.	Deliveries.	Stocks.
August	120,597,234	107,996,911	135,196,930
July	118,277,603	150,539,057	122,596,607
June	116,567,493	131,557,573	154,858,061
May	118,356,146	131,706,078	169,848,141
April	113,574,292	112,656,121	183,198,073
March	117,058,661	106,063,007	182,279,902
February	103,700,817	74,546,614	173,284,248
January	112,135,200	90,362,421	144,130,045

Following are the comparisons of the month's deliveries, indicating how much of the decline in deliveries was due to decrease in domestic inquiry, and how much to shipments abroad, figures being in pounds:

	August.	July.	June.
Deliveries	107,996,911	150,539,057	131,557,573
Exports	48,382,704	75,018,974	70,966,457
Domestic deliveries	59,614,207	75,520,083	60,591,106

The International Testing Meeting in New York in 1912.

The meeting of the International Association for Testing Materials, which was held at Copenhagen, Denmark, last week, adjourned on Saturday, September 11. The invitation extended by Dr. Charles B. Dudley of Altoona, Pa., on behalf of the American Society for Testing Materials was accepted, and the next meeting of the International Association, which will be in 1912, will be held in New York, probably in the fall of the year. Dr. Dudley, who is now president of the American Society for Testing Materials, has been elected president of the International Association.

The International Association for Testing Materials had 2160 members in May, 1909. Germany leads with 375, Russia follows with 293 and the United States is third with 290. Austria has 219; Denmark, 155; France, 166; Great Britain, 96; Belgium and Hungary, 82 each; Switzerland, 83; Sweden, 71; Norway, 46; Holland, 42, and Italy, 60.

New Cars and Locomotives.—Among recent inquiries for railroad cars are 1000 box cars, 25 stock cars and 40 automobile cars for the Seaboard Air Line, 50 flat cars for the Lake Superior & Ishpeming and 200 for the Gilmore & Pittsburgh. The Santa Fé ordered 1000 refrigerator cars from the American Car & Foundry Company and the New Orleans & Northeastern 100 box cars and 100 gondolas. The Northern Pacific is building 450 box cars and 250 automobile cars at South Tacoma and will build 100 cabooses and 800 flat cars. Of the Northern Pacific order for locomotives 11 went to the Baldwin Works and 55 to the American Locomotive Company. The Illinois Central has placed an additional order for 13 and the Burlington for 10. The Delaware & Hudson will buy 10 mallet compounds and the Illinois Tunnel Company, Chicago, is receiving bids on 50 electric locomotives.

The Machinery Trade.

NEW YORK, September 15, 1909.

Business with machinery houses is gradually expanding, but as yet it is rather irregular. Merchants, however, report general conditions of trade very healthy and are confidently looking forward to greatly increased activity by the first of the year. At the present time the betterment which began some months ago is more noticeable and the sources of trade are becoming more numerous. Of these the most active is the automobile industry, which has been one of the mainstays of the trade for a long time, and which has bought so heavily of certain makes and classes of machine tools as to extend deliveries several months. The past week large orders were placed by the Fiat Automobile Company against the list it issued some some weeks back, and the heavy buying by the company was the feature of the trade. The new automobile plants and additions under construction and contemplated are more numerous than those of any other branch of trade and should be important factors in the machinery business for some time to come. Merchants are looking for considerable business from the Palmer-Singer Company and Brewster & Co., both of whom are building new plants in Long Island City. It is rather surprising that the railroads are buying so sparingly of mechanical equipment.

The increased attention being given to the development and protection of the commercial interests of the United States in South America by the State Department, Washington, should tend to increase the demand from that part of the world for American machinery. Secretary Knox has created in the State Department a new division, to be known as the Division of Latin-American Affairs, and has appointed Thomas C. Dawson of Iowa, United States Minister to Chile, chief of the new division, and William T. S. Doyly assistant chief. This division has been created to foster and facilitate American business in Central and South America and to protect property rights.

Large Machinery Purchases of Fiat Automobile Company.

Large purchases of machine tools were made the past week by the Fiat Automobile Company for equipping its new plant at Poughkeepsie, N. Y. These purchases were made against the list issued the latter part of July and covered a large number of turret lathes, lathes, milling machines, shapers, drill presses, automatic screw machines and other tools, comprising a complete equipment for the manufacture of automobiles. The equipment purchased covered a greater number of tools than has been purchased for a long time for an automobile plant in this territory. The amount of machinery bought can be estimated from the cost of the plant, which, we understand, will be in the neighborhood of $500,000. The company has secured a large acreage with railroad connections, on which it will build a main building, three stories, 120 x 265 ft., with five one-story additions, having a total size of 400 x 700 ft. The first of the five additions is to contain the paint room, finishing room and shipping room; the second, the stock room; the third, repair room; the fourth, the millwright room, and the fifth, receiving and inspection room. The main building will be used as a machine shop and for general manufacturing purposes. The tools will be motor driven and electrical power will be supplied by the local power company. The construction will be of steel and concrete. We understand that these buildings are only the nucleus of what is to be eventually a very extensive and complete automobile plant, the plans outlining an ultimate expenditure of about $1,000,000 for buildings and equipment at Poughkeepsie.

The General Chemical Company, 25 Broad street, New York, is arranging to build at Newell, Pa., a plant for manufacturing its output which will be one of the largest chemical plants in the country. A contract for the buildings alone, which amounts to about $64,400, has been awarded to the Nicola Brothers Company, Farmers' Bank Building, Pittsburgh, Pa., and it is understood that the largest of the buildings to be erected will be about 200 ft. square. The plant will include several other structures and the buildings are to be of steel and concrete construction. It is stipulated that they are to be completed by December 22, and before that time, it is said, the company will buy considerable machinery. A power plant to be of 400 to 500 hp. will be installed, together with considerable iron working machinery, generators, pumps and conveying machinery. It is the company's idea at present to install gas engines to be operated by natural gas. As yet no machinery contracts have been let.

A new plant is to be established by the Hays Rapid Tunneling & Mining Machinery Company, Birmingham, Ala., for the equipment of which considerable new machinery will likely be purchased. The company has purchased 3 acres of ground at Queenstown, near Birmingham, upon which it will erect a plant to cost about $20,000. The plans for the plant are understood to have been approved by the Board of Directors, and it is probable that construction work will be started at an early date. The company, which is capitalized at $1,000,000, will manufacture mining and tunneling machinery, turbines, mine pumps, &c.

In the recent announcement concerning the electrification of the Long Island Railroad, it is stated that for the electrification, terminal buildings, yards, laying tracks and purchasing equipment the road has spent $28,000,000, and will have to spend $10,000,000 more to carry out its plans. The expenditure of this large amount of money will undoubtedly mean the purchase of a great deal of various kinds of equipment and supplies.

Some equipment will probably be required by the Johnstown & Gallitzin Railroad, Johnstown, Pa., which has completed plans for a new power house and car barn to cost about $60,000.

The S. H. Roberts Boiler & Tank Company, with offices in the Commonwealth Building, Pittsburgh, and works at Mars, Pa., is asking for estimates on the erection of a new plant to be built at Queens Junction, Pa. The new plant will consist of a main steel frame building, 46 x 160 ft. and 45 ft. high, with a leanto, 20 x 80 ft., to serve as a power plant, and another leanto, 40 x 160 ft. When the buildings are erected the company will move the machinery from Mars to the new plant. The company manufactures car tanks, storage tanks, oil refinery works, boilers and self-supporting steel stacks.

The Scott Iron & Steel Company, Carnegie, Pa., is asking for estimates on two electric cranes, one of 15 tons and the other of 25 tons capacity. The cranes are to be erected on 50-ft. spans and to be wound for 220 volts direct current.

The Chalmers Detroit Motor Company, Detroit, Mich., will shortly be ready to take up the matter of equipment for its new plant, 60 x 400 ft., three stories high, which is to be erected at Jefferson avenue and the Belt Line.

It is understood that the Bullard Car Door Equipment Company, Birmingham, Ala., has acquired a site at First avenue and Fifteenth street, Woodlawn, where it will erect a new plant. The building and equipment will be modern in every respect and it is likely that construction work will be started at an early date, as plans are understood to be about completed.

The Board of Trustees of Painted Post, N. Y., will receive bids until September 23 for the construction of a water works system, including material, tools, &c. Bids will be received for the work complete or for any of the following parts: Pipe system, reservoir, station and pumping equipment.

The Superintendent of Public Works, Albany, N. Y., will receive bids until October for work on the Erie Canal as follows: Contract No. 2E, for completing the construction of the canal from the Mohawk River at Waterford to a point near lock No. 3; contract No. 43, for constructing the canal from a point east of the Oriskany road to about 1500 ft. west of Mud Creek, about 10 miles.

Business Changes.

The Gisholt Machine Company, Madison, Wis., manufacturer of turret lathes, boring mills, tool grinders, &c., has opened an office in room 1253, Hudson Terminal Building, New York, which is in charge of Ellis F. Muther, who will have charge of the company's interests in the East. The Eastern agency arrangement of the company formerly in effect has been discontinued, the intention being to give close attention to the Gisholt machines.

Catalogues Wanted.—The store and offices of Sanford & Cia, S. A., Monterey, Mexico, were destroyed by fire August 21 and the entire collection of catalogues was consumed. The stock destroyed was fully covered by insurance and business is being carried on as usual in new quarters. The company desires to receive catalogues and discount sheets from manufacturers of mining machinery, mill supplies, power transmission machinery, machinists' tools, industrial machinery of all kinds and electrical machinery and supplies.

New England Machinery Market.

BOSTON, MASS., September 14, 1909.

While business is gaining rapidly with the machine tool builders, the dealers have not yet felt any marked response to the beginning of autumn. They generally characterize conditions as fair. The heavier types of machines are moving better; the demand for planers is noticeably stronger, and the larger sizes of turret machines, boring mills and radial drills are selling more readily in this section than they have for two years and more. The works of customers, taking the average, are receiving a constant increase of orders. Probably the inability to recruit working forces

rapidly is responsible to some extent for the delay in placing orders for machinery. Labor conditions are really serious, and it looks as though a great number of unskilled men would have to be trained to efficiency on special work before many shop organizations can be perfected. This is the complaint everywhere. An idea of how the machinery trade, as well as the shops of customers, has been drained of its men by the automobile industry may be obtained from the fact that close to 500 mechanics who were employed in a single New England plant two years ago are now at work in the newer industry, most of them in the Middle West, whence they moved one after another under the inducement of steady work, which they had found unobtainable at home.

The belief grows stronger that a "buyers' panic" in the machinery market is not far distant. Procrastinating customers are hardly awake to the situation. Others are alert to the other extreme and are buying in anticipation of future needs, quite a number of orders having been placed with the builders for machines to be delivered months ahead, when much earlier shipment could be obtained. Hesitation in accepting this class of business is shown in the knowledge that prices will advance later all along the line. Already, as has been stated, the disposition to raise the lists has asserted itself, and it is understood that a few orders for future delivery at the higher figures have been booked where present delivery would mean the old price. Customers in these cases are guarding themselves against lack of equipment later and are willing to pay more rather than tie up more capital at this time.

The Roren Drop Forging Company, Providence, R. I., which has acquired and occupies the plant at East Providence formerly conducted by the Bullard Automatic Wrench Company, will manufacture commercial drop forgings of all descriptions and small tools for customers, as well as a line of small tools of its own, including the Bullard automatic wrench, the patents on which have been acquired; the Schroeder ratchet spanner wrench, combination pliers, and standardized sizes of manufacturing jewelers' plungers, of drop forgings. The plant consists of a drop forge shop, machine shop and polishing and nickel plating department, the equipment of all of which as well as the buildings is only two years old. There are three acres of land, with railroad siding. Albert H. Roren is president and treasurer, and will have personal charge of the business. The plant will be directed by two superintendents, one in the forge shop, the other in the machine shop. Operations have begun and will increase as additional drop forging equipment is delivered. The works will permit of the employment of about 120 men. The Providence territory has had no commercial drop forging plant and the presence of the Roren Company will be appreciated.

The Grant Mfg. & Machine Company, Bridgeport, Conn., has added to its line a riveting machine of the noiseless type, a chief characteristic of which is a throat 11½ in. deep from the tools. It is furnished in three sizes, with either flat or horn table, adapting it to a wide variety of work. Another new machine is a double headed riveter of ⅛ in. capacity or smaller, for riveting simultaneously both ends of a wire passed through the work.

The Builders' Iron Foundry, Providence, R. I., has begun the manufacture of a line of Venturi meters for measuring the feed water of boilers. They are made in sizes from 2 in. upwards, with a minimum capacity of 4000 gal. in 24 hr. They will measure the flow of water accurately at any temperature.

The John T. Young Boiler Company, Norwich, Conn., will erect a new building of wood, covered with iron, 60 x 75 ft., and one story. For the present it will be devoted to storage, but the plan is to make it a machine shop later.

The Bristol Engineering Corporation, Bristol, Conn., manufacturer of taxicabs, commercial cars and automobile parts, will be merged into the New Departure Mfg. Company of that place, as soon as the necessary legal formalities can be provided for. According to a statement given out by President Albert F. Rockwell of the New Departure Company, the action meets with the unanimous approval of the stockholders of both companies, who have in mind a number of improved conditions which will be brought about along the lines of manufacture, business organization and in solving at this time, in a measure, the serious problem of room for manufacturing purposes for the Bristol Engineering Corporation. The New Departure Company will continue along the same line of work, taking over the contracts at present held by the other company. The latter business was established about a year ago and has grown very rapidly, until the question of manufacturing facilities has become a serious one. The company is interested in the operating end of the taxicab business as well as the manufacturing, in which latter department about 300 hands are employed.

The very radical improvement in business among the machinery builders is shown in the experience of a number of representative houses. The Hartford Machine Screw Company, Hartford, Conn., has been operating nights since April 1. The Henry & Wright Mfg. Company, Hartford, is about 700 spindles behind in its orders for drilling machines. The Taylor & Fenn Company, Hartford, machinist and founder, finds business improving rapidly, especially in orders for drill presses. In some lines deliveries are already a month away, and indications are that they will soon be as distant as they were in 1907. The company states that a number of concerns contemplate ordering special machinery. In Nashua the machine tool builders are very busy. This is true with Flather & Co., Inc., lathe builders; the Mark Flather Planer Company, planers and shapers, reports the present problem is one of getting out machinery as rapidly as customers require it, the chief drawback being the difficulty of getting men, and the E. J. Flather Mfg. Company, manufacturer of automatic gear cutting machines and special machinery, states that the present year's product is now entirely sold. The E. J. Manville Machine Company, Waterbury, Conn., is working as many men as during the hight of demand three years ago, and there is a probability of increased facilities with new buildings in the near future. The shops of the Hendey Machine Company, Torrington, Conn., manufacturer of engine lathes, milling machines and shapers, are very busy. In fact, this company has suffered rather less than most machine tool builders during the depression. The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., which builds a wide variety of machinery reaching many lines of industry, finds business twice as good as it was during the depression, the works now running at 75 per cent. of full capacity, with indications to assure a perfectly satisfactory volume of orders in the near future. The Bullard Machine Tool Company, Bridgeport, Conn., is experiencing a general resumption of buying, which while not of the same volume as that of the recent "boom," is exceptionally gratifying when compared with the general dullness of panic times. The automobile industry has been the mainstay during the depression, but the company now finds orders coming from widely diversified sections of the country in greater volume and from a general line of trade. Another large manufacturer of machine tools states that business approximates conditions previous to the recent panic.

The Pratt & Whitney Company, Hartford, Conn., is increasing its working force as rapidly as good men can be secured, and the expectation is that 2000 hands will be at work this fall. Even without the great Australian contract for the equipment of a gun factory, totaling $340,000, current orders would be sufficient to compel a full schedule of production. The great addition built three years ago, with its acres of floor space, will be fully occupied in the near future, as the organization is extended. The high mark of 1907 was 1800 employees, and the present force is already approaching that figure and should pass it before many weeks have gone. The Australian contract is for the equipment alone, comprising machinery tools and fixtures. It was taken in competition with an English company on the latter's territorial ground.

It is announced at Hartford, Conn., that the Pope Mfg. Company, automobile builder, has completed negotiations for the purchase of the property known as the Tube Works in that city, owned by the Shelby Steel Tube Company, Pittsburgh, Pa. This plant occupies 5 acres of land and consists of buildings having 2 acres of floor space, which cost originally about $250,000. The buildings were built by Col. A. A. Pope some 12 years ago. A railroad siding will be an important addition to the conveniences of the Pope works. The Pope Mfg. Company has reached the limit of capacity of its present works at Hartford and at Westfield, Mass., and the new manufacturing space will be put to use immediately upon its acquirement. It is planned to establish later an important department for the manufacture of car bodies, supplementing present facilities at Westfield, and to create a department for the manufacture of wheels, which are now purchased. Ultimately the sheet metal department and others that are overcrowded will be transferred to these buildings. At present the repair shops will be located there. The other changes will probably begin next spring, entailing the employment of 300 additional men. Of course a large amount of new equipment will be necessary in connection with this broadening out of operations. The business has been very successful since its reorganization, in proof of which is the announcement just made that the company will declare an initial dividend at the rate of 6 per cent. this month, and also a dividend of $144,000, representing the full accrued dividend on the preferred stock.

The Trumbell Electric Mfg. Company, Plainville, Conn., manufacturer of electrical supplies, will increase its plant by the erection of a brick building 50 x 50 ft. and four stories, to be used for manufacturing and storage, and an enameling room 25 x 50 ft., one story.

The contract has been let for the new industrial school buildings, Worcester, Mass., which will be 40 x 208 ft. and 50 x 50 ft., three stories. As the school will specialize on the education of boys for the metal trades, a large portion of the buildings will be given up to shop purposes, requiring a miscellaneous equipment.

The Massachusetts Supreme Court has decided against the remonstrants who strove to prevent the building of the section of the Cambridge subway which will cross Boston

Common. This removes the last obstacle to the construction of the line according to the plans of the Boston Transit Commission.

The new building of the Holyoke Water Power Company, Holyoke, Mass., which will be rented for manufacturing purposes, will be 80 x 144 ft., four stories and basement.

The Arrow Electric Company, Hartford, Conn., manufacturer of electrical specialties, has purchased the business of the Marshall Electric Company, Hyde Park, Mass., including the equipment, the entire capital stock having been acquired. Both plants will be operated for the present, but the plan is finally to consolidate the business at Hartford. The Arrow Company proposes to erect a factory of its own later on. To increase immediately present facilities at Hartford the company has taken the ground floor and a part of the upper story of the old Hartford Bedstead Company's plant. Both companies are rushed with business. The Marshall Company employs 200 men when busy. E. F. Grier will be the manager of both works and C. G. Perkins president. The Arrow Company was formerly the Perkins Corporation.

Announcements of increased facilities in general manufacturing outside of the metal lines are the following: Paper mill at Montville, Conn., 236 x 314 ft., of brick, steel and concrete, to be occupied by a paper company which has not yet been organized; Cluett, Peabody & Co., South Norwalk, Conn., addition 48 x 74 ft., two stories, of reinforced concrete; Houlton Woolen Mill Company, Augusta, Maine, addition to mill. Edmund Corcoran, Philadelphia, has acquired the Fitch mill, with an important water privilege at Rockville, Conn., and will occupy it for the manufacture of woolens. The Soale Mill, New Bedford, Mass., will double its capacity by the erection of a building which will house 300 looms and other machinery.

Chicago Machinery Market.

CHICAGO, ILL., September 14, 1909.

The past week has developed no reactionary tendencies in the machinery market, which continues active in nearly all lines. The most encouraging feature observed is the widening demand which embraces all kinds of tools and equipment and is indicative of the substantial basis underlying the present forward movement. Orders for electrical machinery and appliances are not only more numerous, but they include a large number of important contracts representing extensive development projects in hydro-electric and other central station plants. Foundry capacities are more fully occupied and a good many new equipment orders are being placed by the makers of railroad castings. In machine tools the question of deliveries is, on certain lines, taking precedence over price and other considerations. A few makers who in face of the prevailing dullness of the past two years kept their plants going on stock work when short on contract orders, are in position to make prompt deliveries. This policy served the double purpose of preserving shop organization and of securing a commanding advantage in the matter of deliveries, which as delays grow more pronounced will be a factor of still greater importance in securing business. One phase of the present market that points convincingly to the attainment of a broader and firmer basis of industrial expansion is the fact that nearly all of the equipment comprised in the lists that have lately come into the market has been purchased without delay. Earlier inquiries of like nature resulted, as a rule, in orders for only a part of the tools specified and these were usually placed only after a long period of negotiation which signified no urgent need of the equipment sought. It is understood that practically all of the large list covering the requirements of the Central of Georgia Railroad has been arranged for, the business being distributed mainly between three or four of the leading machinery houses. An Eastern railroad is expected to come into the market soon with inquiries for some machine tools, and a Western road is said to be preparing an extensive list of equipment upon which figures will be asked later on. There continues to be more or less buying of scattered lots of tools by the railroads whose shops are generally pretty well crowded with work.

It is understood that orders have been placed through the purchasing office of the Illinois Central Railroad for practically all of the tools and equipment called for in the recent list of the Central of Georgia Railroad. All of the boiler shop and hydraulic equipment was furnished by Joseph T. Ryerson & Son, who also supplied the metal saws and the greater portion of the blacksmith tools, oil furnaces, &c. The same company will also supply the boiler shop equipment for the new Dunkirk shops of the American Locomotive Company.

William F. Burfeind, 188 Madison street, Chicago, is preparing plans for a new factory to be erected for the Cassady-Fairbanks Mfg. Company, manufacturer of hardware specialties, the estimated cost of which is $75,000. None of the machinery required for this factory, which is to be electrically operated, has as yet been purchased.

Announcement is made by an official of the State University of Iowa, located at Iowa City, that preparations are being made for the immediate erection of three engineering shops for the improvement of its engineering department. Contracts for these buildings, the estimated cost of which is about $16,000, has been let to C. W. Ennis, Toledo, Ohio. G. H. Ellsworth is superintendent of grounds and buildings.

The Falls City Machine & Supply Company, Spokane, Wash., has purchased the plant, stock and equipment of the Syphers Machinery Company of that place. The plant consists of a main building, 60 x 100 ft., machine shop, 60 x 90 ft., and fitting shop, 30 x 60 ft., in which is manufactured split wood pulleys, fanning mills, incubators, conveying and elevating machinery; a stock of mill supplies and milling machinery is also carried. Plans are being made by the company for the enlargement of its present facilities, which will include the purchase of a radial drill, lathe, surfacer, shaper, &c., also a special lathe for large pulley work.

The Peters Pump Company, Kewaunee, Ill., is enlarging its plant by the erection of a two-story addition, 18 x 40 ft., which is designed to relieve the overcrowded condition of the machine shop. An elevator is to be installed in the building, together with several new machines, including a turret lathe and bending machine. These will occupy space in the old office room when the present offices are moved to the new building. Further improvement in contemplation is a proposed two story building to be used as a shipping and stock room.

Recognizing the growing importance of automobile garages as buyers of machine tools for the equipment of repair departments, the Marshall & Huschart Machinery Company, Chicago, has issued a special catalogue of garage equipment. It includes a line of tools adapted to such service, embracing medium sized engine lathes, millers, drill presses, shapers, grinders, &c. This is a new field for the machine tool industry, but one which gives promise of continued development.

The E. L. Essley Machinery Company, Chicago, Ill., has secured the agency in Chicago territory for the Colburn vertical boring and turning mills made by the Colburn Machine Tool Company, Franklin, Pa. A complete stock of these mills will be carried at the warerooms of the company at 535 Washington boulevard. Charles M. Robertson, formerly superintendent and boring mill expert of the factory, will have charge of sales in this department from the Chicago agency.

The light and power plant of the Nevada Electric Company, Nevada, Iowa, which was recently destroyed by fire, is to be immediately rebuilt. Plans are being made for a modern fireproof building, for which new equipment will be required, since that of the old plant, with the possible exception of the boilers, is damaged beyond repair. Pending reconstruction a temporary plant is being fitted up.

Bids, it is expected, will soon be asked on the building and equipment for a new ice plant and cold storage warehouse to be erected by a company now being organized at Muscatine, Iowa, by J. T. Martin of that city. Plans contemplate the erection of a building 60 x 140 ft., in which there will be installed a 30-ton ice plant.

Cleveland Machinery Market.

CLEVELAND, OHIO, September 14, 1909.

The local machine tools houses received a fair volume of orders the past week, although business is less active than during July and August, owing to the fact that only scattering small orders are now coming from the automobile manufacturers, who were heavy buyers of machine tools during the previous two months. While the automobile makers are believed to be about through buying large lots of tools this season for enlargement of plants, a good volume of business is in prospect from manufacturers of automobile parts who are planning to enlarge the capacity of their plants. Now that nearly all manufacturers in metal working lines are running their plants at full capacity their present equipment is all in use and a better general demand is expected from this source. As long as manufacturers were running their plants at less than full capacity and a portion of their equipment was idle their purchases of new tools were quite limited. While railroads are not buying extensively the demand for tools from this source has improved materially, as shown by orders received by both the local dealers and machine tool builders. A fair amount of orders is coming from the steel mills. Fairly good deliveries can be secured on all tools except milling machines, although the supply of small sized lathes in dealers' stocks is not plentiful. There is a good supply of second-hand tools on the market, which dealers are holding for good prices, although the demand is not brisk. Dealers expect an improvement in the demand for used tools in case deliveries on new tools become delayed.

The local tool builders are running their plants at full capacity, with enough orders ahead to keep some of them busy nearly all the balance of the year, and several of the plants are being run overtime. Owing to the heavy demand from the automobile industry the supply of machinists is scarce and many capable men would be given employment if they could be found.

In the foundry trade the demand for light gray iron castings is heavy and local foundries are rushed with work. The demand for heavy castings has improved.

The J. D. Smith Foundry Supply Company, Cleveland, reports that it has built this year or has orders for 66 core ovens. This company has recently received the following orders: Seven core ovens for the Western Foundry Company, Chicago; four core ovens, Toledo Motor Car Company, Toledo, Ohio; battery of 12 No. 2 furnaces, Chicago Bearing Metal Company, Chicago, these ovens having a daily output of 12,000 lb.; battery of nine ovens for an addition to the plant of the Falk Company, Milwaukee. This company is now finishing a battery of furnaces and core ovens for the United States McAdamite Company and is shipping a battery of four ovens to Sweden. Its plant is running at full capacity and a large number of inquiries are still coming in for foundry equipment.

John W. Seaver, consulting and contracting engineer, Cleveland, has received a contract from the Keystone Coal & Coke Company, Greensburgh, Pa., for coal and coke handling equipment for the company's rectangular ovens, the order including a pusher, leveler and a gantry coke loading crane. The contract for the equipment has been sublet to the Alliance Machine Company, Alliance, Ohio.

The Modern Machinery & Engineering Company, Cleveland, has received an order from the Driggs-Seabury Ordnance Corporation, Sharon, Pa., for 12 Potter & Johnson automatic machines, and expects to receive shortly a duplicate of the same order. The Driggs-Seabury Ordnance Corporation is preparing to go extensively into the manufacture of automobile parts, and it is understood that it will add considerable machine tool equipment.

The Cleveland office of the Waterbury Farrel Foundry & Machine Company reports the receipt during the past few weeks of a large volume of orders, particularly for board and drop hammers and trimming presses, orders for both classes of machinery having come from manufacturers in Ohio, Michigan and Pennsylvania, as well as a number of orders from the East. The company also has received a very satisfactory number of orders in its other lines.

The Best Foundry Company, Bedford, Ohio, the casting department of the American Stove Company, will double the capacity of its plant by the erection of an addition 200 ft. long. Plans are being prepared by the Interstate Engineering Company, Bedford. The Best Company will buy considerable new foundry equipment, including a cupola, blower and hoisting machinery.

The Ward Nail Company, recently organized in Youngstown, Ohio, has increased its capitalization to $50,000, the purpose being, according to reports from that city, to erect a plant for the manufacture of nails under a new process. The company is now looking for a site. The officers are David Tod, president; A. B. Stough, vice-president; Louis Baldwin, secretary, and D. I. Ward, manager.

The Russell Wheel & Foundry Company, Detroit, Mich., is planning to go extensively into the manufacture of automobile parts, probably axles. The company will use for that purpose a portion of its present plant, installing new machinery. Its list of machine tool requirements has not yet been prepared.

The Cleveland Galvanizing Works Company reports more work on hand than ever before. The company is now running its plant 22 hr. a day.

The Rasor Furnace Company, Barberton, Ohio, has purchased a 4-acre site in that city for a new plant, the property including the buildings formerly occupied by the Lilly Rubber Company.

The Standish Chain Company, Kent, Ohio, has been incorporated, with a capitalization of $18,000. The company plans to make chain and a chain making machine invented by P. H. Standish. The incorporators are P. H. Standish, Dr. O. J. Schneider, Wallace Appleton, J. B. Carey, Daniel Hinds, George Hardy and F. W. Kinney.

Reports from Fremont, Ohio, state that the Fremont Power & Light Company has awarded a contract to Robert R. Lysle of Chicago for the erection of a power house with a capacity of 2500 hp. The company plans to utilize the Sandusky River for furnishing the power for generating the electricity.

Milwaukee Machinery Market.

MILWAUKEE, WIS., September 14, 1909.

From the fact that three of the four or five largest manufacturers of rock and ore crushers, viz., the Gates, Symons and McCully gyratory types, as well as standard jaw crushers, are located here, Milwaukee has come to be the acknowledged center of this industry, and, as an indication of the extent to which construction work is now being actively undertaken, or projected, in all parts of the country, the demand felt here at present for rock breaking, pulverizing and concrete mixing machinery is very significant. Not only is there a heavy run of orders for standard crushers from the No. 2 contractor's size up to the Nos. 9 and 10 machines of the larger quarries, but contracts are at present being executed for No. 12, No. 16, No. 18 and even No. 21 breakers, the last named having a capacity of 1000 to 1200 tons hourly, depending upon the rate at which the rock can be delivered. The greatest activity in ordering new equipment is manifest among custom quarries, but private or governmentally owned ballast, macadam and other road making plants, including those operated for steam and electric traction systems, are coming into the market with increasing frequency. A strong demand also exists for crushers, stamps, tube mills, ball mills, elevators, screens, &c., to be used for ore reduction, both in this country and abroad; Mexico is a particularly good customer. These facts show that the mining industry generally is preparing for an era of large production and that many prospects are being developed, as crushing machinery is necessarily installed in advance of any other equipment for extracting the values from ore.

The machinery trade of this section, as a whole, continues to improve, and machine tool builders especially anticipate a period of prosperity greater than they have ever known. The situation, however, is not without drawbacks, and one of these is the difficulty of increasing manufacturing facilities as fast as they are needed. Skilled designers, mechanics and other operatives are also getting to be scarce.

A difficulty which threatens to become serious throughout the line of metal working industries is the dearth of toolmakers, a large percentage of whom have found remunerative employment in automobile factories during the past two years and now prefer to remain there. This reveals one of the weaknesses of the present apprenticeship system, or lack of system, and gives the advocates of trade schools a strong argument.

The increasing use of high speed machinery, as well as of auto vehicles, is strikingly manifest in the demand for steel castings, which Northwestern foundries are now being taxed to supply. One result of this has been the development of lively interest on the part of the larger concerns in all kinds of automatic or semi-automatic apparatus designed to save time and labor. In iron foundries molding machines have proven such a benefit as to give impetus to experiments along all related lines, and there can be no question but that, for the same amount of floor space, production during the next few years will be at least doubled. For inventive ability the use of improved machines in foundries offers a very promising field.

The Sivyer Steel Casting Company, which leased one of the foundry buildings of the Northwestern Malleable Iron Company and equipped it with new machinery, will build a large plant of its own on a joint belt line of the Chicago & Northwestern and Chicago, Milwaukee & St. Paul railroads between Milwaukee and West Allis. This company has in hand large orders for automobile parts particularly, and sees a very bright future for that branch of the business.

The Menominee Tool Company has been organized by Henry Tiedman at Menominee, Mich., and a factory costing $60,000 to $75,000 will be built this fall. The machinery requirements have not yet been figured out, but will probably include power plant, motors, machine tools, elevators, conveyors, &c.

The Milwaukee Reliance Boiler Works is having plans drawn for an extension 80 x 100 ft., and will require some additional machinery later on.

The first of the projected extensions of the International Harvester Company's Milwaukee works will be a warehouse 80 x 180 ft., six stories high. Bids for the construction and equipment, including elevators, sprinkling system, motors, &c., will be taken next month.

The Cleveland-Cliffs Iron Company has let contract to the Foster Construction Company, Milwaukee, for two steam turbine power plants and two substations near Negaunee, Mich. A steel tank for water storage is also to be erected.

An incinerating plant similar to that now being erected at Milwaukee is proposed for Seattle, Wash.

The Lyons Boiler Company, De Pere, Wis., has taken contract for the large pen stocks to be erected at High Falls, Wis., for the Northern Hydro-Electric Company of Green Bay.

The plant of the Pioneer Graphite Company, near Junction City, Wis., which was recently burned, will probably be rebuilt and enlarged, necessitating the purchase of considerable machinery.

The Thos. B. Jeffrey Company, Kenosha, Wis., has had plans prepared for an additional large extension to its works next year; meanwhile work on one new building to meet immediate requirements is being started.

A new roundhouse, with turntable, repair equipment, &c., is to be erected by the Chicago, St. Paul, Minneapolis & Omaha Railroad at Couderay, Wis.

The Manitowoc (Wis.) Foundry & Machine Company is

concluding arrangements for erecting a new foundry and machine shop, to be completely equipped with metal working machinery of the latest patterns. No detailed list of requirements has yet been prepared.

The Wisconsin Auto Supply Company, Two Rivers, Wis., will enlarge its gasoline engine factory.

John Beck, Ashland, Wis., will put up a new building for manufacturing refrigerators, for the equipment of which woodworking tools, sheet metal cutters and motors will be among the principal requirements.

The Sternberg Autotruck Company, Milwaukee, will build a new plant, 100 x 300 ft., on the border of West Allis, equipping it with boilers, engine, generator, motors and the special tools required for its business. As much as possible of the present machinery will be utilized.

An extension to the Cincinnati works of Allis-Chalmers Company is being made, which will give employment to 1000 additional men. Construction work and the installation of new equipment has already been commenced.

The Milwaukee Drydock Company will build an additional machine shop, 40 x 60 ft., equipped with tools for doing heavy marine work. This company is always rushed with work during the summer and was even able to keep 500 to 600 men employed on vessel construction and repairs last winter.

Philadelphia Machinery Market.

PHILADELPHIA, PA., September 14, 1909.

Business with dealers has been of a day to day character, and sales are usually of small and medium sized single tools. The makers, who draw business from a wider range of territory than the merchants do, are taking on a fair volume of new orders, although few have been of any large size. While there has been no aggressive buying, the trade looks forward to a decidedly better movement in the near future, as idle tools in the general manufacturing and industrial plants are constantly being more fully engaged, under which circumstances purchases for replacement and minor improvement will, it is believed, soon be more extensively made. The railroads are still purchasing rolling stock and motive power quite freely, and are more active in their own repair shops. Little business of importance, however, has been coming to the machinery trade from these sources, although more active buying is expected shortly. Locomotive builders and shipyards are booking a better volume of business, and the latter will, with recent orders, be insured moderate activity for some time. The local locomotive builder, although still far from normal, is better employed and is steadily gaining in point of activity. Sales recently have not been confined to any particular lines of tools, although milling machines and lathes have probably been in the best demand. Delayed deliveries for some makes of the former class of tools have interfered with the closing of business in a number of cases. In the general line of tools, deliveries, while not as prompt in some cases, do not interfere as a rule with the closing of business under consideration.

Inquiries for the most part are confined to small propositions. No large lists of general equipment have come before the trade, although a few small shop equipments have been under consideration. The foreign demand has been quiet, and no business of importance has been placed with either local builders or merchants.

The second-hand machinery trade has been fairly active, although sellers report business rather irregular. Single tool sales of equipment of the better class are reported and prices are referred to as generally satisfactory. The demand for second-hand engines is light and the business transacted has been small in volume. The same may be said of second-hand boilers of the smaller horsepowers. In new power equipment, particularly of the larger capacities, a better demand is noted, although orders do not close very promptly.

A continual slight betterment is seen in the demand for both gray iron and steel castings. Foundries are being operated on a more satisfactory basis, and the tonnage of orders taken shows an increase. Prices are moving slowly upward, owing to the constantly rising prices of raw materials.

The R. S. Newbold & Son Company, Norristown, Pa., has recently booked an order from Germany for three of its patent pipe cutting off machines. An order has also been received from Mackintosh, Hemphill & Co., Pittsburgh, for two electrically driven straightening machines, one for 5 and one for 8 in. beams, angles and channels. A large machine of this type is also being built for the Gary Works of the United States Steel Corporation. The boiler shop department is very busy; a large number of orders are on hand, among which is one for six multitubular water coolers, with mains and connections, for the American Coke & Gas Construction Company, for installation in a Canadian plant.

Bids will be received until September 28 by the Department of Supplies and Accounts, Washington, D. C., for supplying the Philadelphia Navy Yard with a quantity of underground cables and connections and iron and sheet zinc, as per schedules numbers 1695 and 1706, respectively. Information may be obtained by application to the Navy Pay Office, Philadelphia, or to the Bureau.

The Link-Belt Company, Philadelphia, has recently booked quite a large number of orders for delivery in New York, New Jersey, Delaware, Pennsylvania, Rhode Island, Massachusetts, Illinois and Florida, as well as for export. These include coal, coke and ashes handling machinery, elevators, apron, screw and monobar flight conveyors, conveying machinery, carrier and conveying systems, barrel elevators, bucket elevators, &c. The export orders include elevators, conveyers and special sugar handling machinery for shipment to Cuba. Among recent silent chain orders over 500 drives are reported. The company notes a steadily increasing demand for its various classes of elevating and conveying machinery, and is steadily increasing its rate of production.

The Haney-White Company is taking estimates for a concrete warehouse, 100 x 200 ft., to be erected at Broad and Somerset streets.

The Nicetown Plate Washer Company, 1822-1850 West Juniata street, this city, is in the market for a guillotine shear with knives 42 in. or longer, and having a capacity of cutting plate 1½ in. thick. A second-hand machine is preferred.

Bids will be received by the Board of Trustees of the State Asylum for Chronic Insane, at the institution, near Wernersville, Pa., until September 20, for the construction of a sewage disposal plant and connections to the existing system, in accordance with plans and specifications on file at the institution and at the office of the Department of Health, Harrisburg, Pa. Henry M. Dechert is president of the Board of Trustees.

Cincinnati Machinery Market.

CINCINNATI, OHIO, September 14, 1909.

While the local machinery and machine tool markets are devoid of any special feature this week, the promise of midsummer for an active fall trade is being confirmed in all branches of the business. Establishments making standard tools are operating full time in all departments, and a few are running overtime. The lack of skilled mechanics is the chief and about the only cause for discontent among the important tool makers, and this factor is now becoming a serious impediment. Metal trades headquarters are making strenuous efforts to secure needed men for the lathe, drill, milling machine and other special tool builders.

The automobile manufacturers continue to take skilled mechanics from the tool manufacturing communities at considerably advanced wages, and the United States Government has also made this city a seat of operations, endeavoring to secure mechanics and machinists generally for the navy yards.

The indications are for higher prices on tools, but there is no local sign of any special concerted movement in this direction, and it is deemed unlikely that there will be ere the first of the year, as builders of such machinery as a rule maintained prices during the period of depression, which prices were for the most part based on conditions of the early 1907.

The larger builders of tools are really discouraging heavy stock orders at this time, and deliveries of standard tools are promised in very few shops earlier than six to eight weeks. A number of establishments are still busy with special jobs, but are gradually getting rid of this work to make room for their more profitable and satisfactory employment—the making of standard tools.

Work is progressing rapidly on the new Oakley colony, which is to be the home eventually of the largest makers of standard machine tools in this market. The contracts have just been let by the Cincinnati Milling Machine Company for the iron superstructure of its new plant. The part to be built at once will contain about 125,000 sq. ft. of floor space, and the Schreiber Company, which secured the contract, will commence deliveries on the iron, about 550 tons, within 30 days. The plant in its entirety will contain about 500,000 sq. ft., and will be an imposing addition to the manufacturing colony. While the company will retain its present manufacturing property in the Camp Washington District, it expects to get into the new Oakley plant in February.

At the plant of the Cincinnati Shaper Company there is considerable activity getting a new product, the "Cincinnati gear cutter," ready for the trade, and arranging the large addition, built two years ago, to accommodate this branch of the business, which is incorporated under the name of the Cincinnati Gear Cutting Machine Company. A clever arrangement designed by Secretary and Treasurer Larz W. Anderson of the company permits the bringing in of all raw material from the rear and its elevation by traveling crane through the main floor of the shop to the point desired.

HARDWARE

THE increasing attention which is being given to freight matters by merchants and manufacturers is an excellent indication of an improvement in a field too long neglected. Not only are individual houses looking more carefully after their freights, but there is an evident increase in the attention given to transportation matters through organizations constituted for this purpose. There is a tendency in larger places, and to some extent in places of moderate size, to establish freight transportation bureaus representing both shippers and receivers of merchandise, with a view to furnishing an agency for grappling economically with the problems of transportation, which are not only increasingly important, but in some respects increasingly difficult and complicated.

While individual shippers could with great advantage give better attention to their freight matters than is usual, as complete a mastery of the subject as may be obtained through a specialist is out of the question. It is expensive, and, as a general thing, almost impracticable for each individual merchant to acquaint himself with classifications, tariffs and other details essential to the intelligent, orderly and economical administration of this department of his business, and it would be impossible without a great deal of study, investigation and experiment for which the ordinary manager or shipping clerk has not sufficient time. It is, therefore, necessary to the most efficient care of this department to employ experts as is done by large shippers. But this is a costly service, as experts in this branch are scarce, partly because in the past the demand has not produced a sufficient number of persons trained in this line.

A plan in harmony with the spirit of the times is for manufacturers and merchants in the larger places to cooperate in the establishment of freight bureaus, equipped with expert managers and supplied with the information and facilities necessary to enable them to look after the interests of the members in the transportation field. In this way shippers are advised as to the requirements of the law and how they can take advantage of the opportunities for most desirable routing of shipments, classification of goods, consolidation of less than carload shipments into carloads, and for securing the lowest obtainable rates, &c. Attention is also given to auditing of freight bills, tracing of shipments, prosecution of freight claims, proper presentation of grievances, and in general the collection of data and devising of methods for the promotion of the shippers' interests, as well as to aid in co-operation with railroads for mutual benefit and convenience.

There is no doubt that such an organization wisely conducted would be exceedingly advantageous to the manufacturers and the wholesale and retail merchants, whose interests are intended to be safeguarded by it. The attendant expense would be insignificant compared with the benefits secured or with the cost to the members if their freights were looked after individually and at their own charges. Such an organization would be able also to do much in the way of advancing the interests of the community and securing fair treatment from the railroads, a field in which much more may be accomplished by concerted than by individual effort.

We respectfully submit to our readers, especially in the towns and cities, that it is up to them to do something in this direction. Hardware merchants and manufacturers should be leaders in up-to-date methods and movements. If there is such an organization in existence in their communities it should have their active support with a view to making it as useful as possible. If there is no such freight bureau in their town there is an opportunity for the Hardware merchants or manufacturers, who usually occupy positions of influence, to take the matter up with their fellow business men and find a way in which they can work together for their individual benefit, as well as for the public good.

Condition of Trade.

Business among retail merchants is giving many evidences that the fall season has opened. Goods to supply the seasonable demand are coming prominently into sight, whether taken from stock where they have been held in readiness for early display and sale or now being received from the manufacturers or jobbers. There is, too, about the stores the air of renewed activity and the getting of things into shape for fall and winter business. It is to be presumed that some new methods will be tried in connection with the display of Hardware or in the line of efforts to carry on the business so that it will yield the best results. The fact that the holidays are not so very far away is shown in the attention given to getting ready for them. There is little doubt that the tendency in recent years toward increased attention to the finer lines which have so important a place in holiday trade will be continued without interruption, and indeed with perhaps more emphasis than the past two years, when general conditions were not favorable to the sale of goods of this class. There is also throughout the trade a good deal of activity in the matter of buying, comparatively little of which, however, is in a speculative way, for the trade is still moving conservatively, not having entirely recovered from the caution and even timidity enforced by the experience of the past two years. The care exercised in keeping stocks moderate, and in many cases small, makes it necessary to replenish frequently, and this will be done more liberally in view of the prospect for an improved volume of business. The tone of the market in the matter of prices tends to stimulate buyers rather than to depress them, as has sometimes been the case. The following columns, under the head of "Notes on Prices," give an excellent illustration of the way in which a gradual and somewhat higher level of values is being reached in many lines. Fortunately the underlying conditions of finance and industry continue admirable and give ground for confidence in the future course of general business. The wreckage from the panic has been nearly all removed, while some of the lessons enforced by it have, it may be hoped, imparted sounder views of public policy as well as individual enterprise. It is gratifying to observe that the tendency toward a more sane treatment of corporations is already bearing fruit, as illustrated in the renewed purchases by the rail-

roads and the disposition by capital to engage in manufacturing and commercial enterprise with more courage. The condition of the iron market, with its strength of prices and volume of transactions, is an exceedingly important factor in the situation. It would be more satisfactory if great crops could be reported in every section and in all the chief products of the country. But in some quarters only moderate crops will reward the farmers' efforts, but these fortunately will generally command high prices. On the whole, the agricultural contribution to the national wealth is in such volume and of such value as to make it a splendid addition to the resources of the country and an important influence in promoting the general prosperity.

Chicago.

Instead of being dependent largely upon the direct and indirect requirements of agricultural industry, as was the case in the early part of the year, the Hardware trade is now receiving an increasing amount of support from railroad and manufacturing interests whose activities are gradually rising to a normal level. Machine shops, factories, foundries and builders of all sorts of mechanical equipment are more fully engaged than they have been at any time since the memorable panic of 1907 either closed them down altogether or greatly reduced their operations. Business of all kinds has been stimulated by these evidences of returning prosperity, and many lines of Hardware have benefited in a marked degree by the enlarged demand from long unproductive sources and trade has again reached a fairly satisfactory volume. That the lesson taught in the events of the past two years of the wisdom of rational conservatism in commercial affairs has not been forgotten is apparent in the lack of speculative interest in the market. The character of orders coming from retail dealers, while of more liberal size, simply reflect the increase in consumption for which provision must be made. When prices of wire products were dropped to a bargain level last May, a spirit of buying was started which at the current rate of consumption anticipated future demand far in advance. Whatever the element of speculation there was in that movement seems to have been justified by the outcome, for those in position to know say that the great bulk of goods then purchased have been distributed, and with but few exceptions there are no large holdover stocks in warehouses to be drawn upon. Winter goods are beginning to move more freely, and there is an especially good demand for Stove Boards, Coal Hods, Stove Pipe, Elbows, &c. Even where no definite changes of price schedules have taken place the market is stiffer and more evenly maintained. Moreover, such revisions as are announced are almost uniformly upward. At the same time there is no disposition on the part of either manufacturers or jobbers to put prices up until such a step is plainly supported by underlying conditions. In some lines the higher costs of the raw material entering into finished products have narrowed the margin of profit so that a higher scale of prices has been made imperative. But in all such cases the action taken has been along conservative lines. The unprecedented activity in building operations in the city of Chicago is strikingly manifested in the building permits issued for the eight months of the present year endng August 31, the total cost of which is $62,044,630. This is within $6,650,138 of the record for the entire year of 1908, which was the largest of any previous years in the history of the city. No contracts have yet been awarded for the Builders' Hardware required for the new City Hall, which, together with like requirements for the new Sherman House and another large hotel in contemplation, plans for which thus far have not been announced, will aggregate upward of $75,000.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—It is not hard to find encouragement and material for optimistic articles now. In the daily papers from every part of the country there are reported revivals of business interests that have been taking a long vacation. In this city one of the most notable cases is that of the Baldwin Locomotive Works, which began running on full time only last week.

Building operations have been unusually heavy, and while reports from 50 cities for the month of August show an average over last year of 34 per cent., Philadelphia's gain is the second largest, being over 200 per cent.

This section of the country has not had the phenomenal increase in business that some of our Western friends (where agricultural conditions more fully control the situation) have enjoyed, but there has been a steady growth for the past six months, and now that industrial plants are resuming full time and the railroads have begun replenishing their stockrooms, there is every reason to feel confident that the fall business will average very close to the high record of years before the depression.

The vacation season has ended, and with that disturbing element out of the way the force settles down to another 50 weeks of hustle, hoping and expecting it may be a record breaker.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Conditions have continued favorable since our last. "Schock threshing" is coming on satisfactorily, and with favorable weather it will soon be about completed. We are also pleased to add that more stacking of grain than usual has been done and "stack threshing" is now under way.

The crops are coming up fully to the expectations of the past month, and the returns, it is believed, will be generally satisfactory. Thus far this season there has been no damage of consequence from fire or flood, and the probabilities are that the grain in sight will be marketed.

The proceeds of the new crop are just beginning to show in cash receipts from our customers, and from this date will doubtless begin to be much more in evidence. The season is also favorable for the pastures and for the maturity of the very fine crop of corn now about ripe.

Altogether, the year stands high in the farming interests throughout the Northwest, and this means a good degree of prosperity to this section of country generally. There is no boom or wild speculation, but simply a good strong current of business, which now promises to continue for some time ahead. It is a good time to follow the old adage to "Make hay while the sun shines."

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Trade conditions throughout the corn belt and east and west of the Missouri River continue very satisfactory. The harvest of small grains was very large and of excellent quality. The corn crop, which promised to be the largest on record, has suffered in a number of sections from lack of moisture, which will reduce the production somewhat below the average.

Business in all lines is very good indeed and the volume of goods going into consumption progresses with a steady regularity. With good average crops of all kinds and high values for everything produced by the agriculturist the continuance of flourishing business conditions for at least several months to come is certain.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Well, well, since our last report some wonderful things have happened—at least we think they have—for two gentlemen are claiming the credit of having discovered the North Pole. Now all the people in the world will probably be discussing and guessing who did it first, and whether either one of them really did, and what good it is going to do them, or us, or anybody.

Just about the time the first discoverer announced his achievement we had a cold wave. Since the second gentleman announced his discovery the atmosphere has grown very warm, no doubt caused by the arguments as to whether he did or did not.

Another event was the death of Mr. Harriman, which

seems to have been discounted, and consequently has had no bad effect upon the market.

Business continues very good. Since our last report there have been rains in many sections, but the spotted conditions are still very much in evidence. We believe, however, with the crop being absolutely determined that there will be a better feeling in those parts of the country that have suffered from droughts and that business will grow better. The good feature is the fact that prices have stiffened, a good many advances on staple lines are taking place, and an optimistic feeling seems to pervade all manufacturing circles.

We believe the year's trade will terminate with a very satisfactory volume, generally speaking.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—As the fall season approaches we note a gradual improvement in the volume of business. While it is not as good as it was in former years, it is better than in 1908, and the people, from the consumer to the manufacturer, seem encouraged and are expecting continued improvement in trade conditions.

Crops in the South this year, generally speaking, are not satisfactory. In the early spring we had too much rain and in the late summer too much dry weather. Our friends engaged in agricultural pursuits will have to be contented with a small crop at a large price. This, after all, is not so bad. It costs a great deal less money to harvest a small crop of cotton than it does a large one, and the profit per pound or per bale on a small crop sold at a high price is much greater than on a large crop sold at a low price.

Prices of Hardware and Metals seem to be pretty well maintained, every one having renewed confidence in present conditions. All the furnaces, coke ovens, coal mines, &c., are running at their utmost capacity. The only unfavorable report we have heard of is that a little pig iron is being imported. This is very unfortunate and, we think, in permitting it the American pig iron producers are pursuing a very shortsighted policy. If no mistakes are made we believe we will see a continual improvement in business and in 1910 we will be back in the old swing.

Cleveland.

W. BINGHAM COMPANY.—Every one must exercise a little patience. The rush of prosperous times has come in such volume that many factories and dealers have not been able to meet the increased demands of the general public. One of the best and most certain evidences of present and continued good times in future is the large orders placed just at this time for carpenters' and other mechanics' tools. We believe that we have shipped out more tools of all kinds—Hammers, Hatchets, Bits, Drills, Planes, Hand Saws, Files and Levels—in the last six weeks than we did in all the previous four months. The same is true of Builders' Hardware, Screws, Carriage, Machine and Stove Bolts. Immense quantities have gone out and more are called for. What does this indicate? Simply that the people have taken new heart. They feel that they are living in a great and glorious country, with great possibilities before them, and they seem to be taking time by the forelock. They have got through with the muckraker and the trade disturber and are smiling and looking on the bright side of life.

Material that enters into the construction of many articles is advancing in price. Why? Because labor demands higher wages and the cost of living is higher. The cost of living is increased because of higher prices on farm products. So sift it all down, and who is to blame? No one in particular, but the farmer certainly has his innings. What is the difference as long as our people are contented and happy.

The railroads are doing a very large business. The Public Service Commission in New York State reports that 92 per cent. of the 55,000 passenger trains that were moved in that State in the month of June were run on schedule time. The small percentage of delays were chargeable to engine failures or connections. Similar reports may be had from other States. Never before were our railroads run with greater skill or more consideration for comfort and safety.

The same is true of the larger business corporations. They are managed with conservatism, not only for the benefit of their stockholders, but the general public participate in their good management.

Many factories are running up to their limit. Their stocks are light, and the demand on them of late has been very great. One of our largest Hand Saw manufacturing concerns inventoried its stock of Hand Saws some months ago, and to-day the stock shows that it has been cut down two-thirds in spite of steady output, and they make over 1000 dozen Saws a day.

The manufacturers of full weight iron pipe announce an advance in price of one point, both in carloads and less than carloads, f.o.b. Pittsburgh, basis. We are looking for quite a good many changes in staple goods, and we would not be surprised to see a revision on a number of lines.

As an evidence of increased manufacturing and rehabilitating of shops the demand for Steel Shafting at the present time is exceedingly large. We are booking a large tonnage not only for manufacturers and dealers, but orders seem to come from all over the country. Orders for Merchant Steel Pipe, Malleable, Cast, Brass, Water, Steam and Oil Fittings are coming to this market in large quantities.

NOTES ON PRICES

Wire Nails.—New business continues to be received by the mills in comparatively moderate volume, which is expected to increase as the season progresses. During this month buying is usually light, and this condition is emphasized this year on account of the heavy orders placed at low prices in May. As soon as they are out of the way, which will be before long, an increased demand is expected. The market continues firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carload lots to retail merchants	1.85
Less than carloads to jobbers	1.85
Less than carloads to retail merchants	1.95

New York.—Local conditions remain unchanged, demand being moderate and confined to nearby requirements. Wire Nails are generally held at the base price of $2 per keg for small lots at store.

Chicago.—New buying at the ruling price of $1.80, Pittsburgh, has begun and a fair amount of such orders have been entered in the past week. Shipments are still being made against the low priced orders taken earlier in the year, but the bulk of this tonnage has already gone forward. A steady increase in new business is looked for from this time on, and conditions seem to favor heavy bookings when all old orders have been disposed of by the mills. The market continues firm and prices are reported as being well maintained. We quote as follows: $1.98, Chicago, in carloads to jobbers, and $2.03 in carloads to retailers, with an advance of 5 cents for less than carloads from mills.

Pittsburgh.—Leading makers of Wire Nails have practically cleaned up all the contracts taken on the $1.60 basis, and are now engaged in making shipments on specifications against contracts taken on the $1.70 basis, consumers specifying quite freely against these contracts. Since the price of Wire Nails was put at $1.80, new demand has been light, but this has not been construed to mean that it is because of the advance in prices, as there is always a seasonable dullness in demand for Wire products at this season of the year. The manufacturers confidently expect a material increase in new demand when fall trade opens up, which it is expected to do early in October. The Wire Nail market is referred to as being in satisfactory condition from every standpoint, and the present quietness in new demand is expected to improve very shortly and be succeeded by heavier buying. The market is reported firm, and we quote Wire Nails at $1.80, base, f.o.b. Pittsburgh, in carload and larger lots.

Cut Nails.—The demand upon mills continues moderate and shows no falling off in the requirements of the trade. Prices indicate increased firmness, so that $1.75, base, at mill is regarded as about the lowest figure quoted. Some manufacturers are quoting $1.80, base, at mill. Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western market, but in the East this differential is not observed.

New York.—A moderate demand characterizes the local situation. The general price for small lots at store is $2 per keg, base.

Chicago.—The movement in Cut Nails is fairly active so far as jobbers' sales are concerned. The aggregate of business reaching the mills in new orders and specifications shows some improvement in demand and prices are firmer. We are advised that the market is being steadily maintained at the following quotations, with some mills asking 5 cents a keg advance: In car lots to jobbers, Steel Cut Nails, $1.93; Iron Cut Nails, $2.03.

Pittsburgh.—A fair amount of new business is being booked by the mills, and specifications against contracts are coming in at a satisfactory rate. Prices are firmer, and $1.75, at mill, is now generally regarded as minimum of the market, with some makers quoting $1.80, at mill. We quote Cut Nails at $1.75 to $1.80, base, at mill, and it would require a very attractive specification to shade the lower price. Iron Cut Nails are held at an advance of 10 cents a keg over Steel Cut Nails in the Western market. The output of Steel Cut Nails by the La Belle Iron Works of Steubenville, Ohio, for the year ending June 30, was 187,722 kegs, an increase of 60 per cent. over the previous year.

Barb Wire.—Business is not improving as rapidly as manufacturers had expected that it would, but later in the fall a heavy demand is looked for. Limited requirements have made no change in price conditions, which are reported as firm. The market is firm and quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots	$1.80	$2.10
Retailers, carload lots	1.85	2.15
Retailers, less than carload lots	1.95	2.25

Chicago.—Within the past week there has been considerable improvement in the amount of new business being placed. While trade in the South is somewhat disappointing, it is developing in other parts of the country in a satisfactory way. It has not, however, gained full headway, but there is every reason to believe the fall demand will be heavy. Some shipments against old contracts are still going forward, but the tonnage remaining of these is comparatively light. We quote as follows: To jobbers, Chicago, carloads, Painted, $1.98; Galvanized, $2.28. To retailers, carloads, Painted, $2.08; Galvanized, $2.38; retailers, less than carloads, Painted, $2.13; Galvanized, $2.43. Staples, Bright, in carloads, $1.98; Galvanized, $2.28; carloads, to retailers, 10 cents extra, with an additional 5 cents for less than carloads.

Pittsburgh.—Only a few small, scattering new orders are being placed, but the mills anticipate a heavier volume of business when fall trade starts, which it is expected to do in the near future. The mills still have a few contracts on their books taken at lower prices than are ruling now, against which buyers are specifying. Prices are reported firm, and we quote Galvanized Barb Wire at $2.10 and Painted at $1.80 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Fence Wire.—Mills are filling specifications on contract orders, for which there is urgent demand by fence manufacturers. There is also a moderate amount of new business being received. The market is firm at the following quotations per 100 lb. to jobbers in carload lots as follows, on a basis of $1.60 for Plain and $1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75

Chicago.—Fence manufacturers are urgently calling for shipments of specifications against contracts, a good many of which were placed some time ago. Fence factories are running full and are said to be behind on deliveries. A fair amount of new business is being placed with the mills, and the prospects are bright for a fall demand that will keep them busy for the rest of the year. We quote as follows: Carloads, to jobbers, $1.78, base, f.o.b. Chicago.

Pittsburgh.—A fair amount of new business is being booked by the mills, while consumers are specifying liberally against contracts placed some time ago when prices were lower. A material betterment in demand in Fence Wire is expected when fall trade opens. We quote Plain Wire at $1.60 and Galvanized at $1.90 in carload and larger lots, f.o.b. Pittsburgh, subject to 2 per cent. discount for cash in 10 days.

Galvanized Pails.—Low prices on Galvanized Pails to large buyers are now said to reach at least 10 per cent. below cost, caused by cutting and counter cutting, with the result that some of the smaller producers find themselves burdened with obligations in contracts that are unprofitable, some low prices being equivalent to at least 10 and 10 per cent. extra off the old extreme net prices, which were based on Spelter at 5 cents as against 5.75 cents to 5.80 cents now. The market for Galvanized Water Pails, Light, is now in fair quantities represented by a discount of 10 and 7½ and 5 and 5 and 10 and 5 and 5 per cent. from the following list:

Quarts	8	10	12	14	16
Gross	$24 15	$28.35	$30.75	$34.75	$41.50

Extra Heavy Water Pails, galvanized, are quoted at 10 and 7½ and 5 and 5 and 10 and 5 per cent. discount from the list herewith, viz.:

Quarts	10	12	14	16
Gross	$46.85	$49.25	$53.25	$60.00

Round Bottom Fire Pails and Well Pails, galvanized, are quoted at 10 and 7½ and 5 and 5 and 10 and 5 per cent., from the following lists, respectively:

Round Bottom Fire Pails.

Quarts	10	12	14
Gross	$33.50	$35.90	$39.90

Well Pails.

Quarts	8	10	12
Gross	$33.35	$37.35	$41.35

Net prices of Galvanized Pails per dozen, according to the foregoing quotations, are approximately as follows:

Water Pails.

Quarts	8	10	12	14	16
Light	$1.30	$1.50	$1.65	$1.85	$2.20
Extra heavy		2.50	2.65	2.85	3.20
Round Bottom Fire Pails		1.80	1.95	2.15	...
Well Pails	1.80	2.00	2.20	...	...

Coal Hods.—Coal Hods are quoted at 10 and 7½ and 5 and 5 and 5 per cent., from the subjoined list of March 1, 1909:

Inch	15	16	17	18
Galvanized, open, gross	$33.25	$37.05	$39.90	$43.70
Japanned, open, gross	24.70	26.60	29.45	33.25
Galvanized, funnel, gross	40.85	45.60	49.40	53.20
Japanned, funnel, gross	31.35	34.20	37.05	40.85

Net prices of Coal Hods per dozen, in accordance with the foregoing quotations, are approximately as follows:

Inch	15	16	17	18
Galvanized, open	$2.00	$2.25	$2.40	$2.65
Japanned, open	1.50	1.60	1.75	2.15
Galvanized, funnel	2.45	2.75	2.95	3.20
Japanned, funnel	1.85	2.00	2.25	2.45

Galvanized Washtubs.—Galvanized Washtubs, Plain, are subject to a discount of 10 and 7½ and 5 and 5 and 10 and 5 and 5 per cent. from the accompanying list, viz.:

Nos.	0	1	2	3
Gross	$67.00	$79.00	$91.00	$103.00

Double Pointed Tacks.—There has been some stiffening in the prices of Double Pointed Tacks, which are now alluded to as remarkably firm as contrasted with business for some time back.

Oilers.—Oilers, which have been in a somewhat demoralized condition, are thought to be at about the lowest now by some in the trade. While no change is looked for at present an opinion is expressed that they are not likely to go lower, as existing quotations crowd cost uncomfortably.

Steel Goods.—The prices on Steel goods for the ensuing year, it is believed, will be announced in the near future, possibly before the expiration of September. The trade is on the lookout for the action of the manufacturers.

Bolts and Lag Screws.—The manufacturers of Bolts and Lag Screws, on September 14, becoming effective at once, made another advance of 5 per cent. in goods of this class, the details of which are here given. The first advance, in July, was 2½ per cent., followed about a month later by an advance of 7½ per cent., which, with the increase here noted, approximates nearly 15 per cent. in the three advances. The present quotations are as follows:

Common Carriage Bolts, ⅜ x 6, smaller and shorter, cut thread	70 and 12½
Common Carriage Bolts, ⅜ x 6, smaller and shorter, rolled thread	75
Common Carriage Bolts, longer or larger than ⅜ x 6	65 and 10
Machine Bolts, ⅜ x 4 or shorter and smaller, with H. P. or C. P. plain nuts, cut thread	75
Machine Bolts, ⅜ x 4 or shorter and smaller, rolled thread	75 and 5
Machine Bolts with H. P. or C. P. plain nuts, larger or longer than ⅜ x 4	70
Machine Bolts, ⅜ x 4 or shorter and smaller with C. and T. nuts	70 and 12½
Machine Bolts, larger or longer than ⅜ x 4, with C. and T. nuts	65 and 10
Machine Bolts, up to 6 in. in length, without nuts	65, 10 and 10
Machine Bolts, above 6 in. in length, without nuts	65, 10 and 5
Machine Bolt blanks	70
Bolt Ends, with H. P. or C. P. plain nuts	70
Bolt Ends, with C. and T. nuts	65 and 10
G. P. Coach Screws	75 and 10
Cone Point Lag Screws	75, 10 and 5
Forged Set Screws	50 and 10
Tap Bolts	50 and 5

Shot.—The price of Shot is unchanged from the advance of 10 cents per bag recorded on September 1, and officials in the trade do not anticipate any further changes in the near future. It will be recalled that a reduction of 10 cents per bag was made in the summer, which the advance September 1 merely put back on the same level. The existing prices are as follows:

	Per bag.	Per bag.
Drop Shot, sizes smaller than B	25-lb. bags, $1.70	5-lb. bags, $0.40
Drop Shot, B and larger sizes	25-lb. bags, 1.95	5-lb. bags, .45
Buck and Chilled Shot	25-lb. bags, 1.95	5-lb. bags, .45
Dust Shot	25-lb. bags, 2.30	5-lb. bags, .50

These prices are f.o.b. New York or Perth Amboy, N. J., and subject to the usual terms for cash. The usual abatement of 10 cents per 25-lb. bag is made on ton lots.

Heavy Hammers.—There has been an evident improvement during the past two or three weeks in the Heavy Hammer market. This results in part from the starting of the factories and mines and the renewed activity of the railroads, as well as from the purchases of merchants who recognized the probability of higher prices in view of the advanced cost of steel. As a result the market is strong without definite change. The manufacturers are working together in admirable harmony and are anticipating a large demand during the season. While most of them are probably covered at low prices for material sufficient to last them for some months to come, they recognize the wisdom of basing prices, as far as they can, on the present cost of steel. The marked improvement in the market for raw material makes itself promptly felt on a line of this kind, in the making of which labor holds a subordinate place.

Vehicle Springs.—The market for Wagon and Carriage Springs is decidedly firm and prices generally are advanced. Some of the manufacturers are, however, disposed to keep room for later orders, which they are confident will be at higher figures.

Sash Weights.—The Sash Weight market continues in the excellent condition noted in our last issue, with further advances by some of the manufacturers. Quotations in the East seem to be represented pretty generally by $25, which in some cases covers local delivery, but in many is f.o.b. foundry. Some manufacturers are holding at $26. The strength of the market comes not only from the increased demand, but also from the higher prices for raw material now ruling. In view of the scarcity of cheap material some of the founders are compelled to buy better grades of iron at a materially higher price. There does not appear to be much stock on hand with the makers.

Furniture Nails.—There have been trade rumors of a contemplated reduction of price on Furniture or Upholsterers' Nails from 40 per cent. to 50 per cent. discount. The reported occasion for this action is based on the possibility of importation orders which could be laid down in New York, owing to the current customs tariff, which would permit of landing the goods here at somewhere from 40 and 10 to 50 per cent. off the list. Such a reduction has, however, not been made as yet, perhaps because the amount of business in this commodity so far has not warranted the placing of large import orders.

Box Straps.—Box Strapping prices are firmer and less cutting is reported. Quotations formerly made at 50 and 10 and 5 per cent. discount have been advanced approximately to 50 per cent. off, with some concessions obtainable for large quantities, the average advance being equivalent to about 7½ per cent.

Sheet Metal Wares.—The Sheet Metal Utensils in enameled, pieced, galvanized and japanned wares are still in the same disorganized and unsettled condition that has prevailed for over two years, except that the situation now is, perhaps, even more aggravated and prices are lower. The powerful interests in this industry in attempting to control the situation by the quotation of lower prices have found followers in the smaller manufacturers, and the end is not in sight. Many goods in the various lines, it is asserted, are sold at cost and in some instances below cost. Stocks throughout the country are said to be light. Any improvement in existing conditions, it is thought, is contingent on a much greater demand and consequent scarcity of goods, with a resultant advance in prices.

Sash Cord.—The Sash Cord market remains unchanged. The advance of 2 cents per pound on Braided Sash Cord determined on and which was to have been announced September 15, has been indefinitely postponed and will not be made at this time.

Scythes.—Prices on Scythes for the coming season were announced September 15, and are merely a reaffirmation of those governing the business last season with no change either way, the same interests as heretofore adopting them.

Rivets.—The manufacturers of Structural and Boiler Rivets advanced the prices of these goods September 14, making the general quotation as follows, viz., Structural Rivets, $2 and Boiler Rivets $2.10 per 100 lb., subject to the customary extras.

Rope.—There has been an improvement in the market during the week, orders having been for larger quantities in many instances and more numerous, so that from manufacturers' standpoint business is regarded as fairly good. The market for Jute Fiber has gained strength as the result of Calcutta advices, which are to the effect that the new crop may be slightly short of the world's requirements. Prices have consequently advanced a little on future shipments. The following quotations represent the market for moderate quantities: Pure Manila of the highest grade, 8 to 8¼ cents per pound; lower grades of Pure Manila, ¼ to ¾ cent less than the foregoing quotations. Pure Sisal of the highest grade, 7½ to 7¾ cents per pound, base; Commercial grade, 6¼ to 6½ cents per pound. Rove Jute Rope, ¼ in. and up, No. 1, is quoted at 5 cents per pound.

Window Glass.—Notwithstanding the strike of the cutters and flatteners of the American Window Glass Company, the company is working some of its departments with such labor as it can obtain and announces that it has made no change in prices and that it has a good stock of Glass of well assorted sizes in its warehouses. It is reported that there are 32 hand operated factories in blast, with a total capacity of 1022 pots. Some of the West Virginia manufacturers are said to have agreed upon the following discounts, which are referred to as having in some cases been shaded 2½ per cent. The discounts are from the manufacturers' list, January 1, 1901, as follows: Small single strength, 90

and 40 per cent.; large single strength, 90 and 30 and 2½ per cent.; A double, 90 and 30 and 5 per cent.; B double, 90 and 30 and 10 per cent. The local demand is light and jobbers do not seem to be looking for any large increase in the near future. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Alleghany Mountains, are as follows: New England States, from jobbers, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, factory shipments, Single, 90 and 45 per cent., Double, 90 and 50 per cent.; some portions of Pennsylvania are accorded discounts of 5 per cent. better than other States; in the southern States discounts vary from 90 and 25 to 90 and 40 per cent. on Single and from 90 and 30 to 90 and 45 per cent. on Double, from jobbers. While the above prices were recommended by the association, they are not always adhered to, as quotations from some jobbers both East and West show, ranging from 90 and 40 to 90 and 45 per cent. discount on Single and from 90 and 45 to 90 and 50 per cent. discount on Double strength. Daily newspaper reports are to the effect that 20 Window Glass manufacturers at a meeting held at Columbus, Ohio, decided to advance prices 10 per cent., to take effect on September 14. The advance, it was explained, was warranted by the recent increase of wages of skilled workmen of about 8 per cent, and the advance in cost of raw material. It is not improbable that when the demand increases there will be a more general movement toward higher prices.

Nuts.—The prices on Nuts were advanced September 15 by the various manufacturers, in accordance with the following schedule:

	Off list.
H. P. Square, blank or tapped	5.60c.
H. P. Hexagon, blank or tapped	6.05c.
C. P. plain, square, blank or tapped	5.20c.
C. P. plain, hexagon, blank or tapped	5.80c.
C. P., C. T. and R., square, blank or tapped	5.60c.
C. P., C. T. and R., hexagon, blank or tapped	6.40c.

Linseed Oil.—Continued activity characterizes the market, owing to increased demand by Paint grinders and jobbers, the former ordering forward shipments on contract orders. Buying, however, is kept down to actual needs, as new crop Oil will probably be obtainable by October 1 in sufficient quantities to materially effect the market. In view of these conditions all sorts of prices have been made, but there are now indications of additional strength, owing to the limited amount of old crop Oil on the market. Oil is held by some manufacturers on the basis of Western Raw, at 56 cents in five-barrel lots and over. Boiled Oil is 1 cent advance per gallon on Raw.

Spirits Turpentine.—The market has maintained a strong position, and shows an advance in price of 1½ cents during the week. Buying has been confined to immediate or nearby requirements, in jobbing lots, with a fairly good demand. The New York market is represented by the following quotations: Oil Barrels, 60 to 60½ cents; Machine Made Barrels, 60½ to 61 cents per gallon.

Selling at Cost.

IT is sometimes good policy to sell goods at cost. This is illustrated in a recent experience of Major R. H. Dudley of Nashville, Tenn., who has an enviable reputation as a successful angler as well as an able and influential merchant. His ability in both lines is illustrated in a recent occurrence. The major, after a day on Elk River, was returning with a fine string of fish. A native coming along admired the fish and asked the major if he would sell them.

"Yes," said the major, "but as I am not fishing for profit I will sell them to you for cost."

"All right," said the native," and how much shall I pay you?"

"Well," replied the major reflectively, "the fish I catch cost me about $5 a pound, and you may have them at that figure."

It is said that the native suddenly lost his appetite for fish, but whether he was held to the bargain is not narrated.

A Well Arranged Hardware Store.

Methods of Accommodation and Display Adopted by a Brooklyn Merchant.

AMONG the interesting features of arrangement for accommodating and displaying goods in the establishment of William O. Fitch, Kent avenue and South Eighth street, Brooklyn, N. Y., are those shown in the accompanying illustrations. Mr. Fitch's stock includes factory supplies, general Hardware and Tools. The building has a wide frontage, and the main floor is divided into four rooms, with doors permitting passage from one room to another. The two rooms in the center

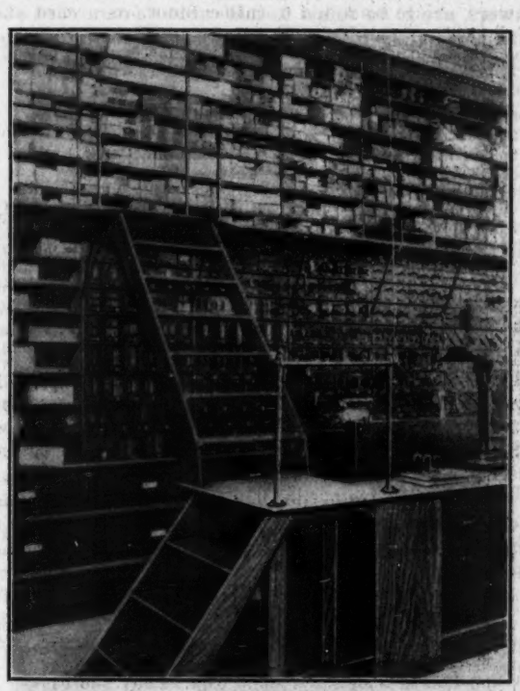


Fig. 1.—Balcony in Hardware Department Reached by Steps.

are salesrooms, one being the Hardware department and the other the transmission department. On either side of the salesrooms are an iron and steel warehouse and a general storeroom.

A Convenient Balcony.

In Fig. 1 is shown a balcony reached by steps, in the room devoted to shelf goods. The balcony is 18 in. wide, 8 ft. from the floor, and 6½ ft. from the ceiling. It is braced below by irons and has a pipe railing running all around for the protection of those using it. The balcony extends along three sides of the room, and is 100 ft. in length. Customers are taken to the balcony to select goods, the same as if they were within reach from the floor, so that all goods are within easy reach with a firm footing for customers and salesmen. The lower platform is on a level with the counter, and the whole arrangement gives the impression of symmetry and good taste.

Fig. 2.—Price Card Cabinet.

On the counter adjoining the stairs is the city desk, and close by are counter scales to weigh the Nails in bins underneath. Between the other end of the counter and the front of the store is a commodious office. Under the shelving ledge the tops of

the bins form steps, with the aid of which the goods in the upper shelves can be reached. The bin fronts are hinged at the bottom, and prices of the goods kept in the bins are marked on the inside of the fronts. Strap and T Hinges, Tool Handles, Nuts, Heavy Hammers and Sledges, &c., are thus conveniently accommodated.

Price Card Cabinet.

On the opposite side of the room and near the front of the store is the price card cabinet shown in Fig. 2. It is made of oak, 15 in. wide, 16½ in. deep, and 40 in. high. It is supplied with 20 slides of ½-in. boards with spaces 1 in. wide. The illustration shows one of the slides stood on top of the cabinet, exposing typewritten lists held in place by thumb tacks and covered with tracing paper to keep them from being soiled. Prices of all goods in the Hardware department, not marked on shelf drawers, are to be found in this cabinet; on a card above and immediately in the rear of the cabinet is an alphabetically arranged index of the lists contained in the cabinet, in part, as follows:

Albany Grease.
Bolts, Carriage.
Bolts, Machine.
Blocks, Tackle.
Butts, Wrought Brass.
Chain Coil.
Chain, Straight Link.
Chisels, Cold, Cape, &c.
Cutters, Pipe.

Prices can be found expeditiously by this arrangement. Steel measuring Tapes are kept in the

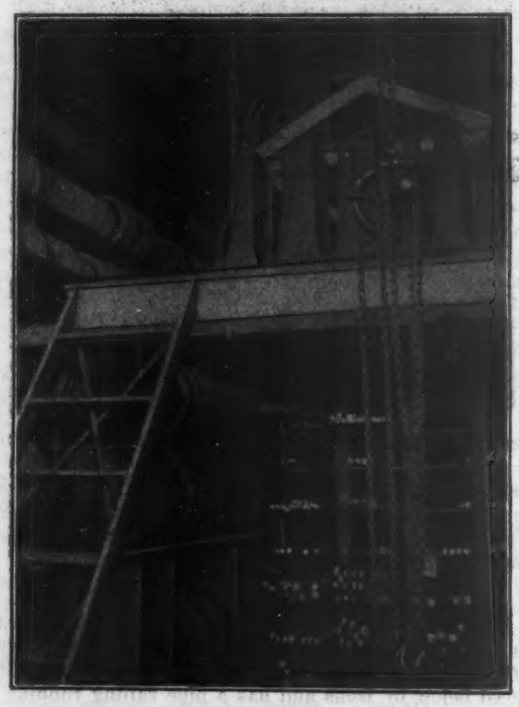


Fig. 3.—A View in the Transmission Department.

lower part of the cabinet, the door of which is kept locked.

Transmission Department.

Fig. 3 is a partial view of the transmission department, as seen from the front entrance, in which are kept Shafting, Pulleys, Hangers, Pillow Blocks, Vises, &c. Pulleys are kept on shelves, except the larger sizes, which are accommodated on the balcony, which is reached by stationary step ladder. The pulleys are drawn up by a chain hoist. The balcony is hung by rods from the ceiling beams, and in addition is supported by I beams, the ends of which are let into the wall. Under the balcony is the rack holding the stock of Shafting.

A portion of the opposite side of the transmission department is shown in Fig. 4, indicating the way Hangers are kept, and also the manner of displaying Vises. Additional Hangers are kept on shelves above the level of the balcony. A black cloth curtain hangs back of the sampled Vises, and behind this surplus stock is kept, from which the display is replenished as sales are made. Prices and sizes of Vises are given on tickets, tacked under each Vise. The Vise rack has been the means of materially increasing the number of Vises sold. It had been found that salesmen were slow about pulling Vises from under the counter to show customers when talking sizes and price.

Shovel Bins.

Along one side of the store room are a series of bins for D handled Shovels. The width of the bins varies

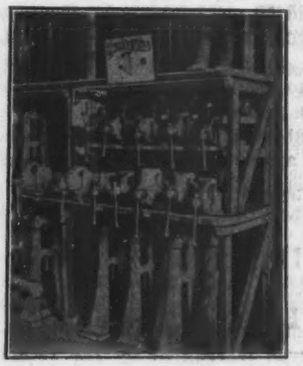


Fig. 4.—Arrangement of Hangers and Vises.

Fig. 5.—Part of the Row of Shovel Bins.

according to the quantity of each variety of Shovel carried in stock. Some of the bins are wide enough to take two bundles of Shovels stood side by side, while others will accommodate only one bundle in width. All bins are deep enough to accommodate three bundles, so that the different bins hold either 1½ doz. or 3 doz. each.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers catalogues, price-lists, quotations, &c.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM FRED HIGGINS, who has purchased the stock of Frank J. Hall, Burnt Hills, N. Y., and is handling Hardware, Stoves, Tinware, House Furnishings, Window Glass, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM THE NORTHERN HARDWARE COMPANY, Petoskey, Mich., which business has lately passed into the hands of F. P. Clark, formerly of Mt. Pleasant, Mich. A wholesale and retail stock of Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Window Glass, Agricultural Implements, Paints, Oils, Sporting Goods and Lumbering Tools is carried.

FROM MUIR & GROSS, who have engaged in business in Saline, Mich., handling Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Window Glass, Paints, Oils and Sporting Goods.

JOHN J. TEEPLE, connected with Fayette R. Plumb, Inc., Philadelphia, Pa., has just returned from a pleasure trip through Italy, Switzerland, Germany, Holland, Belgium, France, England and Scotland. Among visits recalled with special gratification were those to the palaces of Italy's King and to Heidelberg Castle on the Neckar in Mannheim, founded by the count palatine, Rudolf I, at the end of the thirteenth century, Mr. Teeple having seen the ruins illuminated.

OSCAR BUSCH has succeeded to the business of Busch Bros., Union, Mo., handling Hardware, Stoves, Tinware, Housefurnishings, Paints, Oils and Sporting Goods.

THE QUESTION BOX

This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

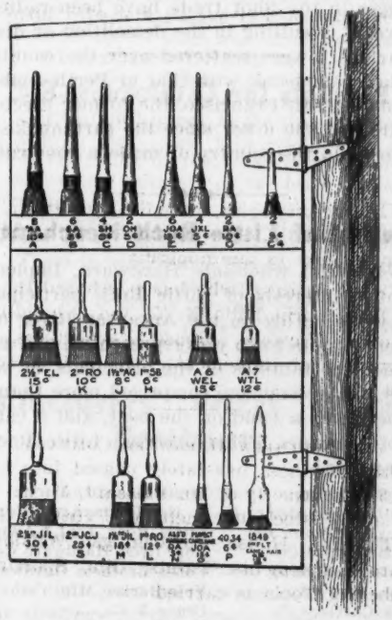
Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

Displaying and Selling Paint Brushes.

Methods Followed by Two Merchants.

A Hardware house in Illinois is looking for suggestions as to the display and sale of Paint Brushes. Herewith we illustrate the method of display used in the store of J. Gabriel & Co., 672 to 676 Grand street, Brooklyn, N. Y. A swinging board is used on which the Brushes are sampled. Under each Brush on cardboard strips is the number of the Brush, the cost, selling price



Sampling and Pricing Paint Brushes.

and a black gummed letter, the letter indicating the original box in which the stock of any one Brush is kept. The boxes are on shelving near the board, and each box has a letter on its front showing what kind of Brushes the box contains. This method of sampling and pricing goods which lend themselves to such an arrangement is gradually being extended throughout the store.

The interesting letter given below comes from an Arkansas merchant, and in addition to the matter of displaying Brushes gives pointers on their sale.

FROM ARKANSAS: A retail dealer wishing to make a success of selling Paint Brushes should of course sell Paints and Oils. He should have the agency for a first-class ready mixed Paint and carry a good stock of specialties, Varnishes and Colors in Oil. These he should give a prominent place in his store, and near them keep his stock of Paint Brushes. The best way to display the Brushes is to have a floor showcase, sometimes called a silent salesman. Arrange the shelves in it in the shape of steps. Cover with a good quality of white cloth and put a sample of each Brush on them. The stock should be kept under the shelves.

Prominent Place for Paints, Etc.

To make money with Paint Brushes the dealer should carry only a few of the well known or advertised Brushes that the Paint jobbers sell at $12 and $18 per dozen to the dealer, and at $1 and $1.50 each to the painter. He should select a line of Brushes that are good and serviceable, and on the small Brushes get from 50 to 75 per cent. profit. On those that he sells to the painters he should try to get 25 to 40 per cent. He should avoid as much as possible showing a painter one of the Brushes catalogued by the so-called jobber who sends prices to painters, selling those only as a last resort, and then offering them at nearly cost.

How to Make Brushes Pay.

We shall value other contributions from our readers as to the methods followed by them in handling this line of goods.

Turning Stock.

Plan of Buying Used by a Western Merchant.

The question as to the number of times a Hardware stock should be turned is a most important one, for the frequency with which a merchant moves his goods has much to do with his success in business. The letter given below is from the secretary of a Western State Hardware association and emphasizes the necessity of keeping the stock as low as possible and yet complete. It also describes the plan of buying followed by a merchant at the writer's suggestion by which in a period of two years he was enabled to reduce his stock carried to the extent of nearly $4000 without curtailing his sales in the least, thus putting him in a position to use this amount of money to his advantage. Our correspondent writes:

In regard to turning stock, I would like to give you the experience of one of our members which will throw much light upon the subject. It will readily be seen that in order to be successful the stock must be kept down as low as possible and still be complete, for the profits on "the goods you are out of" will never come back.

One of our members was carrying a stock of $22,000. He was very anxious to cut it down, as it was larger than his needs required, particularly when compared to his annual sales. His interest on the investment was too large in comparison with his annual sales. At my suggestion he adopted the following scheme: An invoice of goods was received. In addition to the cost and selling price, there were added to these marks the date upon which the goods arrived and the amount. Thus: ½ dozen ½-in. Cold Chisels were received. Every Cold Chisel was marked with a cutlery enamel which flows from a pen as follows: "½ Dozen—4/20/09. BL/20." The next time Cold Chisels were needed they were placed upon the want list as above mentioned—½ Dozen—4/20/09, BL/20. Now if these Cold Chisels appeared on the want list one year hence it would show that one year had been required to sell one-half dozen Cold Chisels. Hence, instead of ordering one-half dozen, one-sixth of a dozen would be ordered. This method was applied to the entire stock. In two years he was enabled to reduce his stock $3800 without curtailing his sales in the least. In other words, he was enabled through this system to take $3800 from the business and invest it in lands which have since brought him a good profit.

Additional Marks on the Goods.

Effect on the Stock.

I throw this out as a suggestion and believe that it can be successfully followed by others in the trade.

Buying in the Retail Hardware Store.

Does It Pay a Retail Merchant to Try to Get Low Prices?

Some time since the question came up as to whether it paid a retail Hardwareman to be a careful buyer, and with this in view to obtain quotations from different parties, or was it safe to trust the jobbing house from whom a merchant usually buys his goods. Letters thus far published indicate a diversity of view as to just how much care and attention a merchant should give this matter. Some in the trade are inclined to be less ener-

getic in looking for low prices than others, while another class seem to regard the selling end as more important. There is, however, pretty general agreement that with the active competition which the merchant nowadays has to cope with from catalogue houses and department stores, it is incumbent upon him to buy his goods from manufacturers or jobbers to the best advantage without getting beyond his depth in quantity. One of the letters given below puts the matter very well in describing the ideal merchant as a careful buyer and a thorough salesman:

Direct Relations.

FROM NEW YORK: I find that it is very often the case that a retailer who will take goods in fairly good quantity can buy from manufacturers at but a small advance over the price paid by the jobber for the same goods. Manufacturers are seeking more and more the retailer in marketing his product. We cannot do away with the jobber altogether, but in these days of close competition it is imperative that the retailer make careful purchases, or he will find his trade is slipping away from him and going to the catalogue house or to some live fellow who "buys right."

Danger of Over-Buying.

There is, however, a danger in this method of buying—namely, overbuying. It is so easy to be attracted by the price that if one is not on his guard he buys a quantity that he cannot handle quick enough to make it of any particular advantage. He might better pay the long price for only the quantity wanted than to take the low price and overstock.

Sources of Information.

FROM IOWA: It is my aim to keep as close to the market prices as I can. I always look over the prices in *The Iron Age* carefully, and in all other trade journals that I happen to get or see. If I receive a catalogue of any kind or price-list I scan it carefully and note what difference, if any, from what I am paying my regular jobbers. I always treat the traveling salesman with respect, and I find it pays, because if he has any good prices to give he will favor those who treat him as he should be treated. Then, if I have had a good price from some outside firm, I talk to these salesmen about it, and I am usually able to get prices to suit on the same quality of goods. It pays to keep posted on prices.

FROM MISSOURI: This is a matter to which merchants should give very careful attention. However, of the two extremes, I believe the merchant who pays more attention to the selling part will be the one that will make the most profit in the end. The ideal merchant, of course, is one who is a careful buyer and a thorough salesman.

Date of Ohio Meeting Determined.

AT a meeting of the Executive Committee of the Ohio Hardware Association, held in Toledo, last week, it was decided to hold the 1910 convention on February 22-23-24. Toledo as the scene of the convention was determined upon at the last meeting. The members of the committee who attended the conference were D. C. Bates, Alliance; Frank A. Bare, Mansfield; J. F. Baker, Dayton; W. L. Milliken and W. L. Jacobs, Columbus, and W. M. Crumrine, Salem. An elaborate programme for the entertainment of the association members and visitors during their stay in Toledo is being prepared by the local committee which has the matter in hand. One of the main features of the convention will be an exhibit of Hardware, and because of this fact the committee has selected the large and commodious Memorial Hall in which to hold its sessions and display its exhibit.

THE E. Z. AUTO GO-CART COMPANY, which is capitalized at $50,000 at a recent meeting of its stockholders held at Monroe, Wis., elected the following officers: President, Fred. Kaplan, Beloit, Wis.; vice-president, David S. Klafter, Chicago; secretary, George E. Throp, Monroe; treasurer, Louis Kohli, Monroe, and superinaendent and manager, Samuel Kneier, Beloit. The plant, which is at present located at Beloit, will be removed at once to Monroe, where the company will be located temporarily in a factory building adjoining the railroad yards. The company is manufacturing a Collapsible Go-Cart, which is referred to as exceptionally attractive and strong. It can be folded up into a small compact package, and only a single motion is required to fold or open it.

Union Metallic Cartridge Company's New Shot Tower.

THE Union Metallic Cartridge Company, Bridgeport, Conn., and 313-315 Broadway, New York, for which the M. Hartley Company is sole selling agent, has undertaken the construction of a Shot making plant for producing the Shot required for the loading of fixed ammunition, which has long since superseded the former method of loading Firearms with Powder and Ball. The Union Metallic Cartridge Company is undoubtedly the largest user of Shot in the United States and probably in the world. The business of loading Cartridges and Shells has grown to such magnitude that the company was compelled to undertake the manufacture of Shot at its own works. With this in view a plant is now in process of erection which will contain the latest and most improved methods in arrangement and machinery and be built in the most substantial manner. There will be an eight-story building, smoke stack and temper house constructed of iron and pressed red brick, the construction reaching a hight of 160 ft. for both stack and buildings, which with the warehouses will cover 2 acres of ground and when finished will be one of the most imposing and interesting manufacturing plants in the city of Bridgeport, differing, as the structures will, from ordinary buildings erected for manufacturing purposes. The tower will have a capacity equal to dropping 100 tons of lead a day, making Shot from the smallest size known as Dust Shot to the largest grades of Buckshot, both chilled and soft. The changes in the Shot trade have been radical in the last five years, resulting in the demolition or dismantling of the various towers scattered over the country. This tower, when completed, with that at Perth Amboy, N. J., and the one at San Francisco, the former erected within three years and the other since the earthquake, are now the only ones in the country of modern construction.

Outing of Little Rock Merchants.

THE retail and wholesale Hardware, Implement and Vehicle interests of Little Rock participated in a very enjoyable outing on the Arkansas River on the 2d inst. Every firm in town was represented, and as the outing included the families of the principals, as well as of the clerks, the assemblage comprised more than 200 persons. There was a band on the boat, and a caterer furnished refreshments. The following Little Rock houses were represented:

Foster Hardware Co.	Louis Koers.
Bracy Brothers Hardware Co.	J. H. Martin Arms Co.
E. D. Bracy Hardware Co.	Little Rock Tent & Awning Co.
Hamilton Hardware Co.	Rose-Lyon Hardware Co.
Jones House Furnishing Co.	Fones Brothers Hardware Co.
Leifer Bros. Seed Co.	Voss-Barbee Mfg. Co.
Little Rock Carriage Co.	Crane & Co.
Trainer Carriage Co.	Brandon & Turner.
J. W. Mast & Co.	Charles T. Abeles & Co.
Dudley E. Jones & Co.	

The idea of the outing is to be credited to W. L. Harlan, the energetic secretary of the Arkansas Retail Hardware Association, who felt it would be desirable for the different wholesale and retail interests of the city to come together in this way. Mr. Harlan looked after the carrying out of the details, and he is to be congratulated on the success of the occasion, which will probably be an annual fixture.

THE EDEY ALARM BELL & LOCK COMPANY, Tacoma, Wash., has been incorporated with a capital stock of $50,000 for the purpose of manufacturing Door Locks and an Automatic Burglar Alarm. The Locks comprise two styles of Front Door Locks, an Office Door Lock, a Store Door Lock, a Bungalow Door Lock and a Latch. The Locks are of simple construction and have very few parts. The alarm bell is also a simple device and can be used on windows as well as doors, and when used on the latter serves as a push button call bell by day.

What Hardwaremen Say on Up-to-Date Topics.

Cash Business—Asking Low Prices on Small Retail Lots—Small Jobbers Desirable Clients.

A Michigan Merchant's Experience with Cash Business.

WE have had many inquiries from the trade in regard to the feasibility of conducting a cash Hardware business, and we have reported many attempts made in this direction. There is a general recognition of the evils connected with the giving of credits as freely as it is extended in many Hardware stores. But comparatively few instances have come to our knowledge in which merchants have been able to abandon the practice altogether. It is indeed a question if, all things considered, this is either necessary or desirable. There should, of course, be a careful limiting of credits as much as possible without injuring the general interests of the business, and credit should, of course, be given judiciously, and when given the matter of collections should be very carefully attended to.

In view of the importance of the subject the experience of the Michigan merchant in doing a cash and a limited credit business is interesting and suggestive:

A Near Cash Business.

Some years ago in another town I did a large credit business which crippled me and was compelled to sell out. I then resolved if I went into business again it would be on the cash plan. When I bought this business it was run down, but I sorted up the stock and advertised that I would sell reasonable for cash and keep as near that as possible. When a customer was good I gave from 10 to 30 days on a small amount, and if he failed to pay at the time specified a statement was sent to him. This is a small town in a good farming country. Most of the trade is with farmers, but not 3 per cent. of my sales are on the book, and all of that is considered good.

Good Results.

Now for the results: Receiving cash, I can pay cash for goods, discount all my bills, buy cheaper and where I wish. There is less trouble keeping books and less collecting and less sleepless nights, and would advise all to get on the cash plan at once. As the times are better there is no excuse for doing a large credit business, with all of its attending evils.

Manufacturers' Prices to Retail Merchants.

Retail merchants are frequently unreasonable in expecting as low prices on the comparatively small lots of goods they purchase as are given to larger merchants buying in much larger quantities. One of the perplexing questions that come up to manufacturers who do not limit their dealings to the largest jobbing houses is in regard to the grading of their prices to the four classes of merchants who are perhaps represented on their order books—large jobbers, smaller jobbers, large retailers and smaller retailers. Touching on one phase of this question the following letter from a Western merchant will be of interest:

We find in most lines it is hard to obtain such concessions from manufacturers as we think we are entitled to, as we do a large factory jobbing business as well as our retail line. We are in direct competition with Toledo, Detroit and Cleveland, who send men to the factories and will sell them just as low as they quote us. We are therefore compelled to make a pretty thin shaving on many goods if we get their trade.

Large Retailers and Small Jobbers.

From a well-known manufacturer we have the following communication in regard to the desirability of manufacturers selling the small jobbers and large retailers. He points out, it will be seen, some of the advantages he finds in dealing with houses of moderate size. It will thus naturally be suggested to enterprising retail merchants that there is an opening before them for the extension of their business along jobbing lines and with direct relations with the manufacturers:

"Illegitimate" Manufacturers.

There has been, in my opinion, a marked increase in the number of small jobbers, many of whom do also a retail business. These houses are very desirable customers. As a general thing they will not haggle and quibble as much as will the large jobbers, who seem to be "built on these lines." The trouble with the large jobbers is that they are, at all times, working very hard to beat down the manufacturer's prices, putting him against all kinds of competition whether legitimate or not. By the word legitimate I mean manufacturers who have a reputation for turning out first-class articles, who have been catering to the trade for some years. In almost every line a class of small manufacturers is spring up every now and then who in order to make an inroad on the trade will often make lower prices than the regular, and will often load up with orders that they cannot possibly deliver promptly, thus demoralizing the market. It is a common thing for one of these manufacturers of small productive capacity to take on more orders (on account of his low prices) than he can possibly fill for months, whereas, as a general thing, staple goods should be shipped promptly on receipt of order. This is what the writer would not call legitimate competition.

Encouragement from Large Jobbers.

Large jobbers show a tendency to take advantage of such circumstances, while the smaller jobber, or large retail house, possibly from his lack of training, or perhaps because he is inclined to be more honest, will rarely do this, which means simply that the manufacturer is better off by having such trade. Again, a small jobber, or large retailer, generally does a large business with consumers, thus obtaining perhaps a larger margin of profit than will the large jobber, and can afford to pay better prices, and will, therefore, do less quibbling with the manufacturer. So that, on a whole, such trade is desirable indeed.

The Atlantic City Conventions.

A CIRCULAR issued by F. D. Mitchell, 309 Broadway, New York, secretary of the American Hardware Manufacturers' Association, conveys the intimation that the attendance at the joint conventions of the National Hardware Association and the manufacturers' body at Atlantic City on October 13 to 15 will probably exceed that of any previous gathering of the two organizations. The accommodations at the Marlborough-Blenheim, where the meetings will be held, have all been reserved, and arrangements have been made with the Hotel Dennis and the Hotel Brighton, nearby, to accommodate visitors who have not yet secured rooms.

The Eastern Canadian, New England, Central, Trunk Line and Southeastern Passenger Associations, embracing territory east of Chicago, St. Louis and the Mississippi River, have granted a rate of one and three-fifths fare, plus 25 cents, on the certificate plan, further details in regard to which can be obtained from local ticket agents.

As in the past, Mr. Mitchell will be pleased to furnish all visitors advising him before October 4 of their intention to be present at the conventions with identification badges, giving the name of the individual and the name and address of the company represented.

It is suggested that inasmuch as during recent years the attendance of houses affiliated with the National Hardware Association at its annual gathering has been generally in the neighborhood of 75 per cent. of the entire membership, and that the percentage will probably be even greater this year, the opportunity afforded manufacturers of meeting the principals of these important jobbing houses should not be overlooked.

Figuring Percentage of Profit.

Should It Be on the Cost or Selling Price?

Makes Little Difference How It Is Done Provided the Profit Shows Up at the Inventory—Other Considerations Which Must Be Taken Into Account.

THE communication published below, which comes from a well-known house in Mexico, discusses the question of figuring profits and takes issue, it will be observed, with the position assumed by many merchants and maintained by Thomas A. Fernley, secretary of the National Association of Jobbers of Wrought Pipe and Fittings, in a booklet distributed by him several months since, in which he advocated the use of the selling price rather than the cost in estimating the percentage of profit to cover cost of doing business, and profit to the selling price rather than to the cost price. Our correspondent makes the point that it is of little consequence which method is followed if the results of the year's business are satisfactory.

Of greater moment, he thinks, are the other considerations which he mentions. He also cites examples where in his business he finds it necessary to sell some goods at nearly cost, for instance, Barb Wire, while other articles yield a very large profit, as in the case of Pumps, on which 100 per cent. is made. The policy of our correspondent in brief is to add all the profit the goods will stand and turn the stocks as often as possible. His interesting letter is as follows:

"How to figure profits" has been discussed so much of late that I wonder if some of the writers think that figuring their particular way will make the profits, regardless of other things. To my mind it is of little importance whether we figure an additional percentage to cost or a corresponding percentage to selling price. What we are after are the increases in our worldly possessions shown at the final summing up, inventory time.

As Much Money Made One Way as the Other.

Thomas A. Fernley in his widely distributed treatise on the subject seems to take the view that if a merchant figures his profit with the selling price for a basis he is safe—presumably because he then cannot figure too low. As a matter of fact the difference between adding a percentage to cost price or adding one to selling price is quite unessential. What matters it if we figure cost plus 50 per cent. to make a profit of 33 1-3 per cent. on the selling price, or cost plus 50 per cent. to make 50 per cent. on the purchase price? We gain as much money one way as the other.

Prices Dictated by Circumstances.

I do not believe that figuring profits on the selling price will keep any foolish merchant from selling his goods too cheaply. Finally, all of us sell, willy-nilly, at such prices as circumstances dictate. None of us can add a percentage of profit on our goods arbitrarily; we necessarily take into account the prices our customers will pay; what our competitors (be they around the corner or in a Chicago skyscraper) are selling similar goods for; what the goods have sold for previously, and a dozen or more other considerations. I believe that the disregarding of one or other of these considerations in the fixing of prices will be much more harmful than adding the percentage to the cost possibly could be.

Mr. Fernley's citation of cases involving people who do not understand percentages is, in my estimation, not to the point. In this day and time there is no room in business for any one so poorly grounded in mathematics—certainly not in the Hardware business.

Selling Cheap Because of Low Cost a Mistake.

Many years ago a very shrewd business man (now gone to his deserts) told me "never let the low cost of goods mislead you into selling too cheaply," and I believe that a very important point. In cities that are large enough to make it possible to attract a good many customers at any given time with a special price it is, of course, possible to gain great advantage by selling cheaper than others. I do not believe that in a relatively small community this is the case. Personally, I would prefer to meet the prices made by competitors, not to cut under them; then to attract the best trade with superior service. It is my practice to fix prices according to what the goods will bear, with little regard to costs. Changing selling price every time a small advantage in cost is had is not, in my belief, a good policy. The natural tendency is toward a lowering of selling prices, and I do not think that that tendency needs any assistance.

A Theory That Cannot Be Followed in Practice.

In some article on this subject we saw it was said that if the cost of doing business was a certain percentage of the year's sales, then this percentage should be added to the selling price of goods to cover expense, and a further addition for profit. While this is true, it cannot be followed in practice. If the expense of doing business is 13½ per cent. of sales (as it was with us last year), it does not follow that we can add that much and more to the price of Barb Wire to fix the selling price. As a matter of fact we sell Barb Wire for cost, plus 5 per cent., and in round lots for cash do it gladly—simply because circumstances make it necessary.

Now then, while this item of Barb Wire apparently falls short of covering expense, which is 13½ per cent., it does not follow that our selling it so low is a loss. As this article sells readily, involves no waste, costs little to handle, it does not cost 13½ per cent. of gross sales to carry it. Other goods, which may have much waste and which take up much valuable space, sell slowly, and no doubt cost not only the average of 13½ per cent., but much more. Of course, I do not mean to say that in a general stock such as we carry it is at all possible to determine just what handling a particular line of goods does cost.

A Fixed Policy.

It follows that in fixing prices we must take all we can and where we can, and that with us it is a fixed policy. While we sell the Barb Wire above mentioned for 5 per cent., we make 100 per cent. on Pumps and get paid for putting them in besides. Why? No one else handles Pumps, they sell slowly, and "the time to take things is when they are a-passin'," as the small boy said when he took all the cookies off the plates.

Quick Turnover Brings the Real Profits.

In a good year we have made above 30 per cent. on our capital, and in a bad one (such as last year) only 14 per cent. The difference has been due entirely to slow sales in the bad year or, say, slow turnover. The management, the percentage of profits added to cost of goods, the losses on accounts have been about equal in the two years. So it is my opinion that in the more or less quick turnover the real profits lie. It is not possible for us to buy goods with much frequency owing to the great distance from sources of supply; otherwise we should have been able to keep up the profits in a slow year by reducing the stock of goods in proportion as sales fell off. I cannot see that a difference in figuring profits (that is, in fixing selling prices) could have any possible bearing on the results; and results are what we want.

Getting on the Jobbers' List.

So let us go calmly on adding to our costs all the per cent. possible, all the goods will bear, all the catalogue house and our friend down the street will let us. Then let us turn our stock often and we will soon all be on the jobbers' list and happy.

Fort Plain Street Fair.

THE eleventh annual street fair of Fort Plain, N. Y., is now in progress, opening up on the 13th inst., and continuing until the 18th. Our readers will recall the elaborate illustrated article given in our columns several months since relative to the special features of this fair, which is a combination harvest festival, old home week and carnival. From a small beginning the fair has become the most important event of the year in the Mohawk Valley, and has provided a most efficient means of attracting business to this enterprising village.

THE SAMUEL WINSLOW SKATE MFG. COMPANY, Worcester, Mass., has received a photograph showing the interior of the London Olympia, the largest rink in the world, with hundreds of skaters on the floor. It indicates the extent to which roller skating is indulged in both in the United Kingdom and Continental Europe. The Olympia Rink, like many others, is equipped exclusively with the Winslow Skates.

The Early History of Barb Wire.

Reminiscences of Jacob Haish.

Modest Beginning of an Important Industry.

SOME interesting reminiscences of the early introduction and development of the Barb Wire industry is contained in a booklet recently published by Jacob Haish, De Kalb, Ill., which city claims the distinction of having produced the first successful Barb Wires. In this booklet, which is intended only for private circulation, are recounted the difficulties met and overcome by the writer in perfecting his invention and devising machinery for manufacturing Barb Wire, which, in the beginning, was made by hand. Going back to the inception of the idea, 37 years ago, the first steps in what has since become one of the leading industries in the trade, and one, too, that has played an important part in its development, are narrated. A striking contrast between the methods of manufacture first employed and those now in vogue are afforded in the following excerpts from the booklet:

Lumber Merchant and Building Contractor.

As a lumber merchant and building contractor from the year 1857 to 1872, I was in constant contact with the lumber interests of the West and had often noted the immense cut of fencing material, increasing yearly, and its bearing upon agricultural interests of the country with its burdensome costs, which led me to think out and provide a substitute therefor.

The Osage Orange Idea.

You may well imagine my efforts were very crude when I state it was in my mind to plant osage orange seed, and when of suitable growth cut and weave the slips into plain wire and board fences, using the thorns as a safeguard against the encroachment of stock. Some of you remember that in the late '60s and early '70s the planting of willow slips and osage orange seed was at a fever heat. I had received a consignment of osage orange seed from Texas, supplying some of my customers with same at $5 per pound. Of course I soon discovered the futility of the osage orange idea and commenced a somewhat random thinking along other lines.

Patent Office Aims Not Understood.

It never occurred to me that the Patent Office might disclose some knowledge of prior use or state of the art; in fact, at this time I hardly realized the purposes of the Patent Office or the need of its services; but later on it behooved me to seek the knowledge of friends familiar with its workings and immediately get in line to protect my interest.

Coming of a New Era.

I saw the coming of a new era in fence building. First was the osage orange, next attachments of metal to wood; later it was all wire, and then I discovered that the latter was the line along which to work. It looked simple, I might say foolish; just a short piece of wire coiled between its ends around a straight parallel wire. I showed the device to a friend and he exclaimed, "Why, Joe Glidden is working on the same thing!"

Perfecting the S Barb.

I immediately switched to another form and manner of applying a Barb Wire to Plain Wire, which proved so much easier to make by hand and fasten onto two plain wires instead of one that I adopted it. Thus I completed what is known as the S Barb and proceeded to its manufacture.

Mr. Haish's Original Barb Wire Plant.

While Uncle Joe was working in his pasture lot, winding his experimental wire on an empty nail keg, twisting it as best he could, I had transformed the second story of my carpenter shop, a building about 40 ft. long, into a Barb Wire factory. Having invented a twisting device as well as a spool—the same as used to-day—and small hand machines to form a straight piece of wire into the form of a letter S, I commenced operations.

The twisting device was placed at one end of the shop and the spool at the other end, with a connecting table between, on which to spread the barbs, and two parallel wires were run from the twister to the spool. The barbs being S shaped, were easily inserted between the wires with thumb and forefinger and were then closed tight with a slight tap of a hammer.

Four men worked at a table, two at each side. Each table was supplied with two twisters and two spools. When the barb had been inserted between the wires and closed down, one man revolved the twister while the other acted as brakesman for the spool.

The barbs were first cut into short lengths by men, and were then taken by boys who placed them between two lugs fastened to a spindle and turned with a crank which formed a letter S shape. These were then taken to the table and spread along its entire length. Thus the S Barb Wire became a marketable product long before a patent was issued for its protection.

A Novel Spectacle.

Even after Isaac Ellwood had become a partner with Mr. Glidden and were working under roof, it was a novel sight to see a workman mount a windmill tower standing on the corner near the present Glidden Hotel, with a pail full of loose barbs, while another workman carried wires up to the platform, from which elevation the barbs were slipped over the ends of the wires, which were carried across the road to the building nearby for the further process of spacing the barbs at proper distances along the wires, greased to facilitate the work, and pinching tight to hold them in place while twisting.

Preserving Wires from Rust.

The next thing to be considered was the preservation of the wires from rust. Paint placed in troughs in front of the twister was tried, but when the twister revolved fresh paint flew in all directions, and this method was therefore abandoned. After many trials I succeeded in securing a dip paint, or varnish, as it was then called, which was very satisfactory. It is interesting to note that no improvement in this method has since been made.

Plain Wire Supply at Chicago Exhausted.

At first Plain Wire was purchased in 500 lb. lots, with a proviso that any unused Wire could be returned. Later it grew to ton lots and then to 5-ton lots, which soon exhausted the supply in Chicago, whose wholesale merchants in those days carried only small stocks of No. 12 Iron Wire—no Steel Wire was to be had—just enough to supply a demand for the grape trellis purposes.

In Summarizing the Development of Barb Wire

Mr. Haish claims his invention of the S barb as the first practical and commercially successful Barb Wire introduced; that one of his early patents shows the first iron posts for field fence with a section of woven wire; that he had in operation the first twisting and spooling device; that he sent out to the trade the first wooden spool carrying Barb Wire, which is practically the same as those now in use; that he secured the first dipping plant for Barb Wire and introduced the first automatic Barb Wire machinery.

Hudson Terminal Concourse Merchants, Inc.

THE 65 merchants conducting booths on the concourse and runways of the Hudson-Manhattan Tunnel Terminal, New York City, have formed a Board of Trade and incorporated as the Hudson Terminal Concourse Merchants. Each member holds one share of stock and the corporation has all the rights and privileges of a business stock corporation to do any kind of business, including that of conducting a department store, and is privileged to publish a magazine or daily paper. It is the intention to publish a 32-page monthly entitled the *Concourse*, which will include advertisements of merchants, illustrations of booths, short stories, tunnel news, railroad time tables, &c. Charles M. Russell, president of the Metropolitan Hardware Company, is president of the new corporation, and its secretary is K. B. Conger, secretary of the various McAdoo interests.

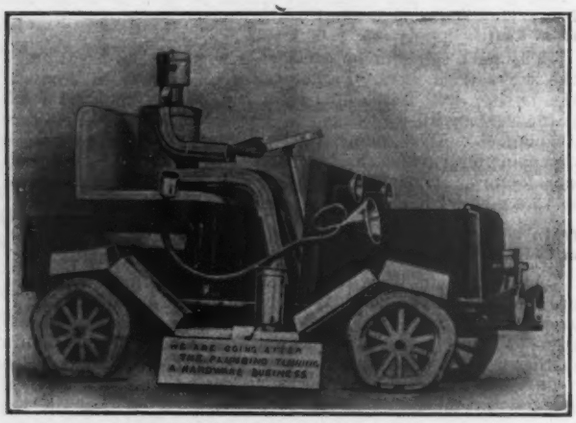
JOHN E. SOMMERS, Clarksdale, Miss., was in New York last week on a trip which combined pleasure with the buying of goods and looking after the interests generally of his house. Mr. Sommers is the energetic and popular secretary of the Mississippi Retail Hardware Association and has taken a very prominent part in the organization since its formation.

Stalker Hardware Co.'s Automobile Window Display.

Gasoline Engine in the Basement Furnished Power to Revolve the Wheels.

THE Hardware trade may be depended upon to take up the latest fad as a subject for show window displays. Teddy Bears have had their day, Automobiles and Airships seem to be popular now, Eskimos and Cook-Peary cotton North Poles will soon arrive, and after the Hudson-Fulton celebration in New York City battleships may become as prime favorites for window trim as they were after Dewey's fight in Manila Bay. No other line of merchandise lends itself so admirably to such displays.

The accompanying illustration represents an Automobile displayed in the window of the Stalker Hardware Company, Algona, Iowa. The makeup was as follows: The frame of the Auto, 2 x 5½ ft., stood on a platform 15 in. high. The wheels had 3-in. Conductor Pipe El-



Going After Business in the Stalker Automobile.

bows for tires and an axle made of ¾-in. Gas Pipe. Pulleys attached to the Axles were belted to a small Gasoline Engine in the basement, below the window, which furnished the motive power to revolve the Wheels. This introduced a moving feature into the display, which is always attractive to onlookers. The running board of the machine was a Slaw Cutter; Angel Food Tins were used as shields to protect the Wheels; a Hot Air Side Wall Register did duty as the Radiator, with a Gasoline Oven as housing over the engine.

For head lights there were two Funnel Washing Machines, and for emergency lights two Soap Dishes. The steering wheel was a 10-in. Cake Tin and the stem to the wheel Brass Tubing. A High Back Porcelain Sink, set on Roasters, answered for a seat and a Bread Box for the tool box. The "honk honk" was a small Funnel and Tin Oiler attached to either end of a piece of Rubber Hose.

The driver was fireproof, having a Galvanized Oil Can for body, arms and legs of Conductor Pipe and Elbows; neck, a Pint cup, and head, a ½-gal. Tin Pail. This was decorated with a Tea Kettle Spout for nose, Picture Nails for eyes, Tea Strainers for goggles, a small Skimmer for cap and Drawer Pulls supplied the ears. Although the wheels revolved rapidly no arrest for exceeding the Iowa speed limit is recorded.

THE warehouses of Reilly Bros. & Raub, Lancaster, Pa., were destroyed by fire on the 5th inst., the loss being in the neighborhood of $50,000. As only smoke entered the main store, little or no loss was suffered there. There is a blanket insurance on the entire stock of $81,000 and an insurance of $45,000 on the buildings. This being the season of the year when the firm was fully stocked up, it is estimated that the goods on hand amounted to a total value of $100,000.

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After every storm the sun will smile; for every problem there is a solution, and the soul's indefeasible duty is to be of good cheer.— *William R. Alger.*

Work for Yourself.

Work for yourself. Don't do your best to please some boss or foreman or superintendent or president. That's a hireling trick. Do your best because you cannot afford to do less; because you owe it to your self-respect. Merit your own esteem. Dig for it. Do your own faultfinding with your work. You know it best. You can see the flaws quicker than any one else. Don't hide them. Talk about them if you must talk about your work. Let others discover the merits, if they exist. Shut your ears to praise. Why should you be pleased that your work finds favor in the eyes of others? Who are you working for, anyway; the other fellow or yourself? Stick to that point of view. That way freedom lies, for no man who works for himself is dependent. Make your employer dependent upon you. That will put you beyond the reach of dyspeptic caprice. Men who are afraid of their jobs are plenty; men who idealize their work are mighty scarce, and all the arrogance in the world cannot change the man who works for himself into a trembling, cringing wretch.—*Sewell Ford.*

Do Your Own Faultfinding.

Vim.

Whatever puts more vim into a workman is a business asset. If a man can be made to take a more intelligent interest in his work and put the force of his own purpose behind it, that is a condition worth working for. To add 25 per cent. to the gross sales of a business may not mean as much in net profit as to add 25 per cent. to the efficiency of the working force—to get them to give 25 per cent. more vital work for the same expense. This principle is well understood in the manufacturing business and in other lines where there is a tangible relation between the expense and the output. But it is often overlooked in dealing with men of responsibility. Such men, being human, are affected by moods and degrees of interest in their work even more than the employee, who does more mechanical or routine work. Not to recognize this and conserve it, not to stimulate it and mold it along lines of improvement, is one of the greatest wastes of paid for energy and intelligence that can be found anywhere in the business world. The only worse thing is to attempt to govern such men too closely and so deprive them of the spontaneity and initiative of individual action. Few things add so much interest to the work of a responsible man as the intelligent and cordial appreciation of his work by his equals and superiors and the feeling that there are standards which he must still strive to attain.—*W. P. Warren.*

Stimulating the Responsible Man.

Satisfaction.

Every workingman who is worth his salt (I care not whether he works with his hands and brains or with his brains alone) takes satisfaction, first, in the working; secondly, in the product of his work, and, thirdly, in what that product yields to him. The carpenter who takes no pleasure in the mantel he has made, the farm laborer who does not care for the crops he has cultivated, the weaver who takes no pride in the cloth he has woven, the engineer who takes no interest in the working of the engine he directs, the author who takes no pride in his book, the business man who is not deeply engrossed in the business he is building—these are monstrosities. The Oriental, hot climate figment that labor is a curse is contradicted by the experience of all the progressive nations. The Teutonic stock owes everything that is great and inspiring in its destiny to its faculty of overcoming difficulties by hard work, and of taking heartfelt satisfaction in this victorious work. It is not the the dawdlers and triflers who find life worth living; it is the steady, strenuous, robust workers.—*Charles William Eliot.*

Monstrosities.

Taking Life Seriously.

I am just beginning to think that at the present age life is now more of a serious proposition than I have ever viewed it before and I am getting down to business. In the past I did not give it much consideration and let things, to a certain extent, take their own course. But I believe that we should give every small detail in our life the utmost attention. I think that it is a good plan for a man not only to go with men of his own caliber, but to try and go with those that are better, and see if he can raise his personal value in the stock market of other's minds. Another point I am just beginning to see is, why associate with a certain class that is of no value and could not do you any good if you wanted help or reference?—*Extract from Traveling Salesman's Letter.*

One's Company.

For Clerks.

Slipshod methods make slipshod men, and slipshod men make slipshod methods. Hitch your wagon to the system star, and then keep it hitched.

Gimp is backbone, energy, determination. It is what keeps people everlastingly at it. It is what pulls success out of failure. Cultivate gimp.

The clerk who waits on customers with an out-of-the-window look in his eyes is worth about half the pay he's getting. Selling goods takes every bit of a man's attention, and he will fail often enough then.

Read all the store literature that you can get hold of. Methods of doing business are changing every day, and the live man changes with them.

The public has confidence in the man who has confidence in himself. They will soon find out if he lacks it.

If you're not good at resisting temptation, don't go where temptation is.

Don't get in need of money so badly that you would be willing to take it dishonestly.

Keeping up one's courage is to a great extent a matter of habit. Lots of men are chronically down in the mouth just because they have formed the habit. Right beside such men you will find others 50 per cent. worse off and a 100 per cent. more cheerful.

Learn to be a good loser. A reverse of fortune dismays the wise man no more than would a change of the moon.

Include as much outdoor air as possible in your daily routine. Fresh air will make brains as well as brawn. It will increase a man's earning power and give him staying properties.—*Frank Farrington.*

Clauss Silent Salesman No. 24 Razor Case.

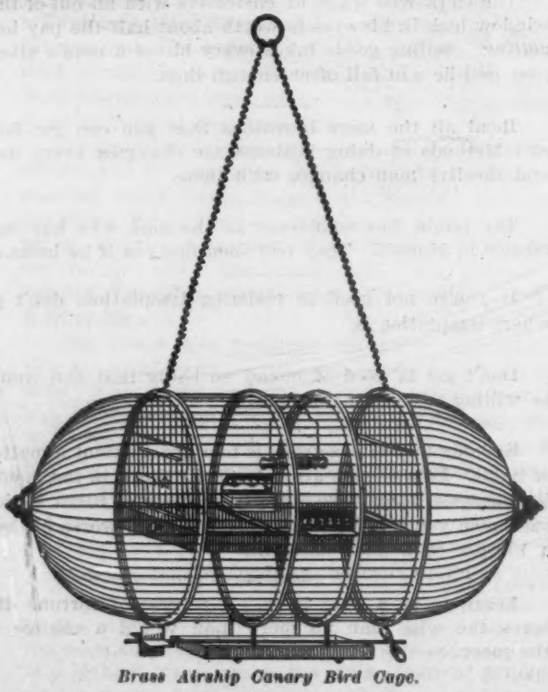
THE accompanying illustration represents a 24-piece razor case containing goods manufactured by the Clauss Shear Company, Fremont, Ohio. It is 7 in. wide and 14¼ in. long, with rubber top and red plush silk lining. A counter pad accompanies each case, so that the Razors can be nicely shown. The case can be placed in any counter or upright showcase, so that the goods cannot readily be taken, and can be closed and the goods stored away at night. The case accommodates 24 Razors

Clauss Silent Salesman No. 24 Razor Case.

and is furnished without charge with an order for 12 dozen Razors.

Brass Airship Canary Bird Cage.

O. Lindemann & Co., 35-37 Wooster street, New York, have brought out a novelty in the bird cage line, as shown herewith. The cage is of brass, 9½ in. in diameter and 21 in. long, made in airship form. One end of the cage



Brass Airship Canary Bird Cage.

may be opened so as to afford access to the door and to pull out the zinc drawer for cleansing. The cage may be set on a table for cleaning, &c., as the car has four feet to rest on. Each cage is packed in a paper box.

Central Seamless Bread and Cake Makers.

The Central Stamping Company, 172-174 Fulton street, New York, is manufacturing the Central seamless bread maker, Nos. 10 and 010, and the bread and cake maker, No. 26. Aside from quality, convenience and adaptability, the prime features of these utensils are the thoroughness with which ingredients may be easily and quickly mixed and kept in sanitary condition. Good results in bread or cake making depend largely on the kneading, which insures a complete even distribution of the leavening agents and various materials before placing in the oven. The curved mixing rod and lever handle produce better results in less time than is possible by the hand method, as well as being more cleanly. As the pans are seamless, there are no hiding places for particles. Fig. 1 illustrates the Central seamless bread and cake mixer, No. 26, which is especially suited for small families in making raised doughnuts, sponge cake, loaf cake, quick biscuit, gingerbread, cookies, rolls, meat loaf and kindred kitchen products. It is 11 in. in diameter at top and the clamp has 1⅝ in. opening. Fig. 2 shows the bread maker, made in Nos. 10 and 010, both 10-quart size, but different quality. The No. 10 is extra heavy and made of IXXX tin plate, the 010 being IX plate, both retinned, as in the No. 26. The clamp opening is 1¾ in. and the supporting parts malleable iron. The capacity of the Nos. 10 and 010 sizes, which are 14¾ in. in diameter at the top, ranges up to six loaves of about 1 lb. each. The cover of the No. 10 slips over the handle and makes a close fit for raising the sponge over night. A slight movement of the small lever on handle instantly releases it and the supporting arm separates by reversing the thumbscrew slightly.

Fig. 1.—Central Seamless Bread and Cake Maker.

Fig. 2.—Central Seamless Bread Mixer.

Boeke & Raymer, operating two Hardware stores, one at Forreston and the other at Lena, Ill., have sold the former to J. B. Fenton, Freeport, Ill.

J. B. Automatic Sash Lock.

Joseph Bounoil, Bridgeport, Conn., New York office in charge of J. N. Limeburner, at 84-86 Chambers street, is manufacturing the J. B. automatic sash lock. It is designed primarily to insure proper ventilation and enables the individual to instantly graduate the volume of fresh air desired according to continually changing conditions and yet secure the occupant against intruders. Fig. 1 illustrates the No. 2 grade, and is automatic; that is, when the hinged locking member is released it drops into position and by means of the rubber cushion on it causes a friction against the side of upper sash that makes it impossible to lower it, although the upper sash may always be raised or the lower sash lowered, even from the outside without releasing, thus always reducing or closing the opening. There is a cheaper form,

Fig. 1.—J. B. Automatic Burglar Proof Ventilating Sash Lock.

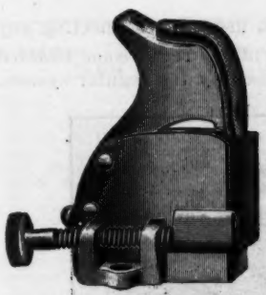


Fig. 3.—Lock with Locking Thumbscrew.

Fig. 2.—Lock with Chain to Hold Friction Arm Back.

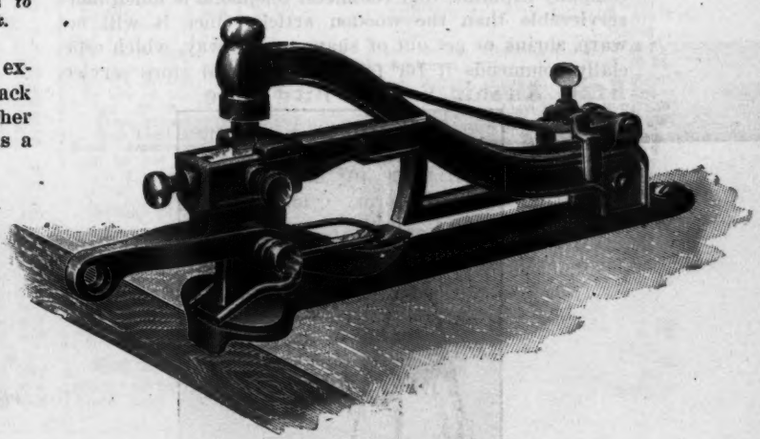
No. 1, that is the same in construction, practically, except that it is not automatic and may be thrown back so as not to operate until desired. Fig. 2 is of higher type, although embodying the same essentials. It has a

Fig. 4.—Working Model Showing Lock Applied.

chain and pin by means of which, if a maid is cleaning the outside of the window and sitting on the sill, the window may be temporarily released from the locking mechanism by inserting the pin so as to hold the arm back. Fig. 3 represents another style (which, as the goods are now sent out has the chain and pin, as in Fig. 2), but in addition there is a side thumb screw for positively locking the sash so that an intruder cannot release the pressure by slipping a thin strip of metal between the rubber faced hinged arm and the sash. Fig. 4 shows the lock screwed to the top of lower sash and the method of using it. The goods are packed 12 in a box and with a fair stock order a sample sash for demonstrating will be sent gratis.

The Foote Hammer Saw Set.

In connection with the saw set, here shown, a treadle is provided which is placed on the floor and connected with the hole in the part of the set that projects beyond the bench by a string. The set can be held in place on the bench with a small nail or screw, and when the foot of the operator is pressed forward on the treadle it pulls the lever down and trips the hammer. The tooth of a saw to be set is held over the bevel in the steel anvil. As the hammer always strikes in exactly the same place a very little experience enables the operator to know just how to hold the saw to have it set the tooth correctly and to acquire speed. The stroke of the hammer can be increased by lightening the thumb screw over the spring. To change the bevel of the tooth, the thumb screw at the end is turned in or out and the anvil is secured in position by means of the thumb screw at the side. The manufacturer has noticed that when a particularly good job is desired a professional saw dresser invariably resorts to a little block of steel with a bevel filed in it, and uses a steel punch and hammer to set a saw. Among the points of excellence the following are mentioned: That the set embodies all the features of ease of operation, speed and positive uniformity of set, that it will set a saw from the finest to the coarsest gauge, comparatively quicker and easier, and exactly right, as the hammer strikes every tooth with the same force; that the machine will give as good results when operated by a novice as by an experienced operator and that an inexperienced operator can set a saw just as



The Foote Hammer Saw Set.

perfectly as when it first came from the factory. The set is put on the market by the J. B. Foote Foundry Company, Fredericktown, Ohio.

THE New York branch of the Bromwell Brush & Wire Goods Company, Cincinnati, Ohio, recently established at 97 Warren street, is in charge of Walter O. Stuart, Eastern representative. A full line of samples of the company's product is on exhibition, and includes Scrub, Whitewash, Shoe, Stove, Shoe Polishing, Milk Can and other Brushes. Other goods sampled are Rat Traps, Flour Sifters and innumerable kinds of Wire Goods made by the company.

THE G. W. GRIFFIN COMPANY, Franklin, N. H., for which John H. Graham & Co., 113 Chambers street, New York, are selling representatives, are now putting up the Griffin all hard Hack Saw Blades in strong pasteboard cartons of one dozen each, in the different lengths, widths and number of teeth, with directions, the observance of which in using the Blades will insure the best results.

All Metal Crown Telephones for Various Purposes.

Included in the line of all metal telephones manufactured by the Standard Mfg. Company, 990 Housatonic

Fig. 1.—Telephone for Factory Use, Designed for any Number of Stations Up to 20.

avenue, Bridgeport, Conn., are those shown in the accompanying illustrations. It has been demonstrated, the company explains, that the metal telephone is much more serviceable than the wooden article, since it will not warp, shrink or get out of shape in any way, which especially commends it for factory, office and store service.

Fig. 2.—Inter-Communicating System for Factory or Apartment Houses.

The style shown in Fig. 1 is for factory use, the system being designed for any number of stations up to 20. The combination receiver and transmitter is used, thus giving considerable latitude when talking and at the same time enables the user to have the free use of one hand. In Figs. 2 and 3 is shown an inter-communicating system, which is used either for factory or apartment houses. The flush room phone, Fig. 3, is used to connect with the vestibule phone, Fig. 2, and takes the place of

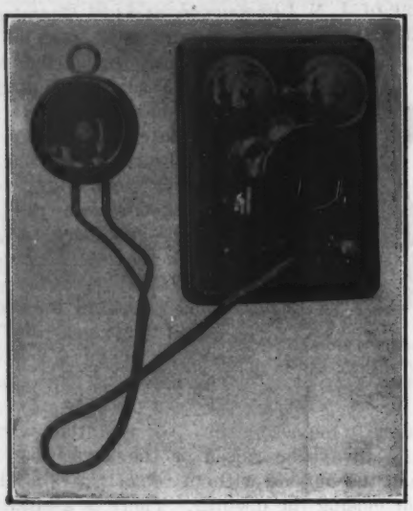


Fig. 3.—Inter-Communicating System for Factory or Apartment Houses.

the speaking tube commonly in use. For connecting any two points, especially in factories, to reach some isolated place which has not been reached by the regular system,

Fig. 4.—Type of Telephone Used to Connect Any Two Points, for Reaching Some Isolated Place Not Reached by the Regular System.

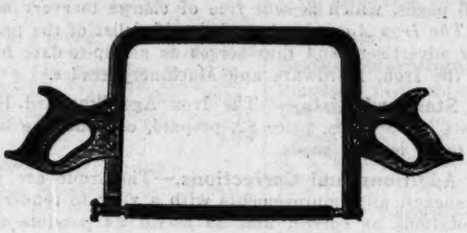
the telephone shown in Fig. 4 is used. The metal phones, like the wooden ones, are operated by ordinary wet or dry batteries.

Carpenters' Scratch Gauge.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has brought out a carpenter's scratch gauge, No. 429, which has excellent features. It is made from steel with octagon shaped periphery, case hardened; both rods moving through the head either way. Two 5-16 in. bars, one plain 4-in. long, and one graduated in thirty-seconds of an inch, 8 in. long, with sharp, hardened and tempered circular rotating cutters on the ends slide through the body of tool. Either is adjustable in relation to the other, and may be used to make two marks at once, or by slipping one back into the head out of the way the remaining bar may be used for single lines. The gauge is finely finished, and has but one fastening screw to hold both bars with a frictional pressure or to firmly lock.

The Goodell-Pratt New Hack Saw Frames.

The hack saw frame shown herewith and put on the market by the Goodell-Pratt Company, Greenfield, Mass., is designed for cutting rails, girders or other articles where a deep cut is necessary. The frame enables a cut



The Goodell-Pratt New Hack Saw Frame.

of 10¼ in. to be made and is furnished in two sizes, one each for 14 in. and 17 in. blades. An advantage is in the two handles, which permits two men to work simultaneously.

The American Tap & Die Company's Cutlery.

The American Tap & Die Company, successors to Nichols Bros., Greenfield, Mass., has made additions to its lines of cutlery, including curved slicers, narrow scimiter, kitchen knives, pallets or spatulas, kacp knives for rabbis' use, Richmond and Carolina tobacco knives; also butchers' steels.

A New Style of American Fence, Design 943.

The American Steel & Wire Company, Chicago, Ill., announces a new design of American fence, having nine bars, 43 in. high, which it recommends for general farm use. The spacing of the bars at the bottom is close, and the construction is such as to hold horses, cattle and sheep. The fence is put up in rolls of 20, 30 or 40 rods each and is made in four weights or specifications.

Teare & Anderson have purchased the Hardware business of Thos. Dorgan, Middletown, Ill.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₩ gal. bbl.	lots
Linseed, Western, Raw	.56	@57
State, Raw	.56	@57
City, Raw	.57	@58
Boiled, 1¢ ₩ gal. advance on Raw.		
Raw, Calcutta, in bbls	.75	@..
Lard, Prime Winter	.93	@96
Extra No. 1	.57	@58
No. 1	.48	@50
Cotton-seed, Crude, f.o.b. mill	4¾	@ 4¾
Summer, Yellow, prime	5¾	@ 5¾
Summer, White	6	@ 6¼
Yellow Winter	6	@ 6¾
Tallow Oil, Acidless	.57	@..
Menhaden, Brown, Strained	.32	@33
Northern, Crude	.22	@23
Southern	.23	@23½
Light Strained	.32	@33
Bleached Winter	.36	@..
Extra Bleached Winter	.38	@..
Cocoanut, Ceylon ₩ lb	7⅛	@..
Cochin ₩ lb	8¼	@ 8½
Cod, Domestic, Prime	.38	@..
Newfoundland	.40	@42
Red Elaine	.43	@47
Saponified ₩ lb	5¾	@ 6¾
Olive, Yellow	1.35	@1.40
Neatsfoot, Prime	.55	@56
Palm, Lagos ₩ lb	5½	@ 6

Mineral Oils—

	₩ gal.	
Black, 29 gravity, 25@30 cold test	12½	@13
29 gravity, 15 cold test	13	@13½
Summer	12	@12½
Cylinder, light filtered	20	@20½
Dark, filtered	17½	@18
Paraffine, 903-907 sp. gravity	14	@14½
903 sp. gravity	13	@13½
883 sp. gravity	10½	@11
Red	13	@13½

Miscellaneous—

Barytes:			
White, Foreign	₩ ton	$18.50	@20.50
Amer., floated	₩ ton	17.00	@18.00
Off color	₩ ton	12.50	@15.00
Chalk in bulk	₩ ton	3.00	@ 3.40
China Clay, Imported	₩ ton	11.50	@18.00
Cobalt, Oxide	₩ 100 lb	1.45	@ 2.60
Whiting, Commercial	₩ 100 lb	1.45	@1.50
Gilders	₩ 100 lb	.52	@ .64
Ex. Gilders	₩ 100 lb	.56	@ .68

Putty, Commercial—₩ 100 lb

In bladders	$1.70@2.00
In bbls. or tubs, 100 lb	1.20@1.45
In 1 lb to 5 lb tins	2.65@3.25
In 12½ to 50 lb tins	1.50@1.90

Spirits Turpentine—₩ gal.

In Oil bbls	59½@60
In Machine bbls	60 @60½

Glue—

	₩ lb	
Cabinet	.12	@15
Common Bone	7½	@ 9
Extra White	.18	@24
Fish, liquid, 50 gal. bbls., per gallon	.60	@1.20
Foot Stock, White	.12	@14
Foot Stock, Brown	9	@11
German Common Hide	.10	@12
German Hide	.12	@18
French	.10	@40
Irish	.13	@16
Low Grade	.10	@12
Medium White	.14	@19

Gum Shellac—

	₩ lb	
Bleached, Commercial	.16	@17
Bone Dry	.20	@21
Button	.30	@30
Diamond I	.26	@..
Fine Orange	.20	@21
A. C. Garnet	.18	@18½
Light Orange	.17	@19
Kala Button	.13	@15
D. C	.25	@26
Octagon B	.22	@23
T. N	.16	@17
V. S. O	.24	@25

Colors in Oil—

	₩ lb	
Black, Lampblack	.12	@14
Blue, Chinese	.36	@46
Blue, Prussian	.32	@36
Blue, Ultramarine	.13	@16
Brown, Vandyke	.11	@14
Green, Chrome	.12	@16
Green, Paris	.22	@24
Sienna, Raw	.12	@15
Sienna, Burnt	.12	@15
Umber, Raw	.11	@14
Umber, Burnt	.11	@14

White and Red, Lead &c.—

	₩ lb	
Lead, English white, in Oil	10⅛	@10⅝
Lead, American White:		
Dry and in Oil, 100, 250 and 500 lb kegs	6¾	
Dry and in Oil, 25 and 50 lb kegs	7	
Dry and in Oil, 12½ lb kegs	7¼	
In Oil, 25 lb tin pails	7¼	
In Oil, 12½ lb tin pails	7¾	
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	8¾	
Red Lead and Litharge:		
In 100 lb kegs	7	
In 25 and 50 lb kegs	7¼	
In 12½ lb kegs	7½	
In lots of less than 500 lbs, ½¢ ₩ lb advance over above prices of White and Red Lead and Litharge		
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.		

Zinc, Dry—

	₩ lb	
American, dry	5¼	@ 5¾
Red Seal (French process)	6¾	@ 7
Green Seal	7¼	@ 7½
German Red Seal (French process)	7¼	@ 7¾
Green Seal	7⅝	@ 8
White Seal	8¼	@ 9
French, Red Seal	8⅝	@ 8½
Green Seal	10¼	@10¾

Dry Colors—

	₩ lb	
Black, Carbon	.5	@10
Black Drop, American	3½	@ 8
Black Drop, English	5	@15
Black, Ivory	.16	@20
Lamp, commercial	3	@ 5
Blue, Celestial	4	@ 6
Blue, Chinese	.30	@31
Blue, Prussian, Domestic	.28	@30
Blue, Ultramarine	.5	@15
Brown, Spanish	¾	@ 1
Carmine, No. 40	2.65	@2.75
Green, Chrome, ordinary	3½	@ 5
Green, Chrome, pure	.17	@25
Metallic Paint, ₩ ton, Brown	$16.50	@$22.00
Red	$14.00	@$18.00
Ocher, American ₩ ton	$12.00	@15.00
American Golden	1	@ 5
French	1¼	@ 2
Foreign Golden	3	@ 4
Orange Mineral, English	.10	@12
French	12¾	@13
German	.12	@13
American	8½	@10
Red, Indian, English	5	@ 7
American	3	@ 3½
Red, Turkey, English	4	@10
Red, Tuscan, English	7	@10
Red, Venetian, Amer. ₩ 100 lb	$0.75	@1.50
English ₩ 100 lb	$1.15	@1.60
Sienna, Italian, Burnt and Powdered	3	@ 9
Italian, Raw, Powdered	3	@ 7
American, Raw	2¼	@ 3
American Burnt and Pow'd.	2¼	@ 3
Talc, French ₩ ton	$18.00	@25.00
American ₩ ton	15.00	@25.00
Terra Alba, French ₩ 100 lb	.80	@1.00
English ₩ 100 lb	.90	@1.00
American ₩ 100 lb, No. 1	.75	@ .80
American ₩ 100 lb, No. 2	.60	@ .65
Umber, Turkey, Bnt. & Pow.	2¾	@ 3
Turkey, Raw and Powdered	2¾	@ 3
Burnt, American	2	@ 2½
Raw American	2	@ 2½
Yellow Chrome, Pure	12¼	@13
Oxide Red, American	2	@ 7½
Vermilion, English, Imported	.70	
Chinese	$0.90	@1.00

THE IRON AGE

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Current Hardware Prices.

General Goods.—Goods which are made by more than one manufacturer are printed in *Italics*. The prices named represent those obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, a book of 376 pages, which is sent free of charge to every subscriber to *The Iron Age*. It gives a classified list of the products of our advertisers and thus serves as an up-to-date DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists," 218 pages, price $2, prepaid, contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

North's 10%
Upson's Patent 25%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 25%
Ives' Stop Bead Screws and Washers 25%
Taplin's Perfection 25%

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 3, $0.65; 4, $1.00; 5, $0.50.
Quick Shifter, ℔ doz. pairs ..... $2.00@$3.00
Spitali Quick Shifter, ℔ doz. pairs ..... $1.65@$1.75

Anvils—American—

Eagle Anvils ..... ℔ 9¢
Hay-Budden, Wrought ..... 9½@9¾¢
Trenton ..... ℔ 9½@9¾¢

Imported—

Swedish Solid Steel Paragon, ℔ lb ..... 10@10½¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 10½¢; 350 to 600 lb, 11¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00 ..... 15&10%

Augers and Bits—

Com. Double Spur 80%
Jennings' Patn., Bright ..... 65&10@70%
Black Lip or Blued ..... 65@65&5%
Boring Mach. Augers 70%
Car Bits, 12-in. twist ..... 40&10%
Ford's Auger and Car Bits ..... 40&5%
Ft. Washington Auger Co. 35%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list 50%
Russell Jennings' ..... 25&15&2½%
Mayhew's Countersink Bits 45%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits ..... 60&10%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist 60%
Snell's King Auger Bits 50%
Snell's Star Auger Bits ..... 50&10%
Swan's Auger Bits ..... 65&10@70%
Swan's, Jennings' Pattern 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Ford's, Clark's Pattern 60%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $18.00; large size, $26.00 ..... 60&10%
Swan's 60%

Gimlet Bits—

	Per gro.
Common Dbl. Cut	$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.25	

Hollow Augers—

Bonney Pat., per doz. ..... $5.50@6.00
Ames ..... 20&10%
Universal 20%

Ship Augers and Bits—

Ship Augers ..... 40&10@50%
Ford's ..... 33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ..... 33⅓&7½%
Buell's 50%

Awls—

Elmore Tool Mfg. Co.:
Tinners' and Brad Awls ..... 55&7½%
Scratch Awls 40%

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $4.75@5.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axles— *Iron or Steel.*

Concord, Loose Collar ..... 4¼@4½¢
Concord, Solid Collar ..... 4½@5 ¢
No. 1 Common, Loose ..... 3½@4 ¢
No. 1½ Com., New Style ..... 4¼@4¾¢
No. 2 Solid Collar ..... 4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... 70%
Nos. 13 to 14 ..... 70%
Nos. 15 to 18 ..... 70&10@70&10&5%
Nos. 19 to 22 ..... 70&10@70&10&5%

Boxes, Axles—

Common and Concord, not turned ..... lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent ..... lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—

Caldwell new list ..... 50&10%
Pullman ..... 50&10%

Spring—

Light Spring Balances ..... 50&10@60%
Chatillon's:
Light Spg. Balances ..... 50&10@60%
Straight Balances ..... 40&10&50%
Circular Balances ..... 50&10@60%
Large Dial ..... 30@30&10%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb. ... per lb., 2¼@—¢

Prying and Pinch—

Elmore Tool Mfg. Co. 75%

Towel—

No. 10 Ideal, Nickel Plate ..... ℔ gro. $3.50

Beams, Scale—

Scale Beams ..... 40@40&10%
Chattillon's No. 1 ..... 30%
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ℔ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.25.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $3.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—

Blacksmith, Standard List:
Split Leather ..... 60@60&10%
Grain Leather ..... 50@50&10%

Net Prices.

Hand—

Inch..	6	7	8	9	10
Doz..	$5.50	5.50	6.00	7.00	7.50

Molders—

Inch..	10	12	14	16
Doz..	$8.50	11.00	13.50	14.50

Bells— Cow—

Wrought Cow Bells 75%
Jersey ..... 75&10%
Texas Star 50%

Door—

Reading Hardware Co. 50%
Home, R. & E. Mfg. Co.'s ..... 55&10%

Hand—

Polished, Brass ..... 60@60&10%
White Metal ..... 60@60&10%
Nickel Plated ..... 50&10%
Swiss ..... 50&10%

Miscellaneous—

Farm Bells ..... lb., 2½@3¢
Church and School ..... 60@60&5%

Belting— Leather—

First Quality, Ex. Hy., Strictly Short Lap ..... 60&10%
Standard ..... 70&10@70&10&5%
Light Double ..... 75&10%
Cut Leather Lacing ..... 45@50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Competition (Low Grade), 70&10@75%
Standard ..... 60&10@70%
Best Grades ..... 50@50&10%

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 25%

Bicycle Goods—

John S. Leng's Son & Co.'s 1909 list:
Chain, Parts, Spokes 50%
Tubes 60%

Blocks Tackle—

Common Wooden ..... 75@75&10%
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined ..... 50&10@60%
Embossed ..... 50&10@60%

Bobs, Plumb—

Keuffel & Esser Co. ..... 33⅓&10%

Bolts

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ x 6 and smaller 75%
Larger and longer 70%
Common Carriage (rolled thread):
⅜ x 6, smaller and shorter, 75&5%
Phila. Eagle, $3.00 list ..... 80@—%
Bolt Ends, with C. & T. Nuts 70%
Machine (Cut Thread):
⅝ x 4 and smaller ..... 75&5%
Larger and longer ..... 70&5%

Door and Shutter—

Wrought Iron:
Wrought Barrel Japanned, 80&10&10@85%
Barrel Bronzed ..... 60&10@70%
Spring ..... 70&10&10@80%
Square Neck ..... 75&10@80%
Square ..... 80@80&10%
Ives' Mortise Door 25%
Ives' Wrought Door 25%

Expansion—

F. H. Evans' Crescent ..... 40@40%
Richards Mfg. Co. ..... 55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type ..... 60&10&5&2½%
Star, Wood Screw Type 40%
Star, Machine, Single Wedge 60%
Star, Machine, Double Wedge ..... 60@10%
Star Toggle Bolts 60%
Steward & Roman Mfg. Co.:
Style No. 13, Double ..... 60@10%
Style No. 1, Single ..... 60@10%
Style No. 100, Dbl. Jaw, Shingle 55%
Lag Screw 66⅔%
Star Screw Anchors, Hollow 40%

Plow and Stove—

Plow ..... 65&5@70%
Stove ..... 85&5@85&10%

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84 ..... 80%
Eagle Phila., list Oct. 16, '84 ..... 82½%
Bay State, list Dec. 23, '99 ..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ..... 80%
Eagle Phila., list Oct. 16, '84 ..... 82½%
Eclipse, list Dec. 23, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 23, '99 ..... 80%
Norway Phila., list Oct. '84 ..... 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 23, '99 ..... 80%
Phila., Eagle, list Oct. 16, 1884 ..... 82½%
Upson Nut Co.:
Tire Bolts 80%

Borers, Bung—

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10%

Braces—

Common Ball ..... $1.50@$1.75
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 61, 166, 206, 614 ..... 50%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 40%
Mayhew's Quick Action Hay Patent ..... 40&10%
Millers Falls Drill Braces ..... 25&10%
P. S. & W. Co., Peck's Pat Revised List ..... 60@60&5%

Brackets—

Wrought Steel ..... 80@80&5%
Griffin's Pressed Steel ..... 75@75&10%
Griffin's Folding Brackets ..... 70&10%
Stanley's Pressed Steel ..... 75&10&5%
Stanley's Folding Brackets ..... 70&10&5%
Taplin Victor Handy Egg Beater Bracket ..... ℔ doz. $1.50

Broilers—

Kilbourne Mfg. Co. ..... 75&20%
Wire Goods Co. ..... 75&10%

Buckets, Galvanized—

Net, per gross.

Quart	10	12	14
Water, Light	$18.15	19.70	22.65
Water, Ex. Heavy	30.00	31.60	33.45
Fire, Rd. Bim	21.45	23.00	25.55
Well	23.90	26.45	29.00

Butts— Brass—

Wrought 65%
Cast Brass, Tiebout's ..... 40&10%

Wrought Steel—

BRIGHT.

Extra, 5¢ —

Light Narrow, Light Reversible ..... 75&5%
Reversible and Broad ..... 75&10%
Loose Joint, Narrow, Light Inside Blind, &c. 75%
Back Flaps, Table Chest 70%

BRONZED.

Light Narrow, Loose Pin 55%
Light, Loose Pin, Ball Tip 65%
Broad 85%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800 ..... 30%
Hendryx Enameled 35%

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¾¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel ..... 4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Caps— Primers—

Berdan Primers, $2 per M ..... 20&5%
Primer Shells and Bullets ..... 15&10%
All other primers per M ..... $1.50@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10&5%
38 C. F., $7.00 ..... 10&5%
22 cal. Rim, $1.50 ..... 10&5%
32 cal. Rim, $2.75 ..... 10&5%
B. B. Caps, Con. Ball, Swgd $1.90
B. B. Caps, Round Ball $1.40
Central Fire 25%
Target and Sporting Rifle ..... 15&5%
Primed Shells and Bullets ..... 15&10%
Rim Fire, Sporting 50%
Rim Fire, Military ..... 15&5%

Casters—

Bed ..... 65&10@70%
Plate ..... 60@60&10%
Philadelphia ..... 70&10@75%
Gem (Roller Bearing) ..... 70&10&10&5%
Steel Gem (Roller Bearing) 70%
Standard Ball Bearing 45%
Yale (Double Wheel) low list ..... 40&10%

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	½	⅝
$7.45	4.80	3.85	3.25	3.10	3.00

¾-⅞-1. 1⅛ to 1¼ inch.
$2.90 3.00
German Coil ..... 70&5%
German Pattern Coil:
6-0 to 1 ..... 70&10&5%
2 and 3 ..... 60&10&10@70%
4, 5 and 6 ..... 50&10@50&10&5%

Halter—

Halter Chains ..... 60&5@60&10%
German Pattern Halter Chains, list July 24, '97 ..... 70&5%
Covert Mfg. Co.:
Halter ..... 30&10&10%

Trace, Wagon, &c.

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring $26.00
6½—6-2, Straight, with ring $27.00
6½—8-2, Straight, with ring $30.00
6½—10-2, Str'g't, with ring $35.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c: No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c ..... 70&10@—%

Miscellaneous—

Jack Chain:
Iron ..... 60&10&10@70%
Brass ..... 60&10&10@70%
Safety and Plumbers' Chain 75%
Gal. Pump Chain ..... lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil ..... 35&2½@40%
Triumph Dog ..... 50&10@60%
Brown Halter and Coil ..... 45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion, Post ..... 50&10&10%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain 70%
Universal Dbl.-Jointed Chain ..... 50&10%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set ..... 88¢
Aluminoy Sash Ribbon, per 120 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set ..... 8¢

Chalk—

Carpenters' Blue .... gro., 50@55¢
Carpenters' Red .... gro., 50@55¢
Carpenters' White .... gro., 40@45¢

Checks, Door—

Bardsley's 35¼%
Reading, Ogden ..... 20&5%
Pullman, per gro. $24.00
Russwin 37½%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemen's Chests, with Tools 30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 45%
Tool Cabinets 45%
C. E. Jennings & Co.'s Machinists' Tool Chests 7½%

Chisels—

Socket Framing and Firmer

Standard List .. 80&10@80&10&10%
Buck Bros. 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&7½%
Socket Framing No. 15 ..... 25&7½%
R. & E. Mfg. Co. ..... 10@70&10%
Swan's ..... 66⅔@70%
L. & I. J. White & Co. ..... 30@30&5%

Tanged—

Tanged Firmers ..... 35&10@40%
Buck Bros. 30%
C. E. Jennings & Co. Nos. 191, 181, 25%
R. & E. Mfg. Co. ..... 25@30&5%
L. & I. J. White Co. ..... 25&5%

Box—

Elmore Tool Mfg. Co. 50%

Cold— lb.

Cold Chisels, good quality .. 13@15¢
Cold Chisels, fair quality .. 11@12¢
Cold Chisels, ordinary .... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels ..... 50&5%

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Beach Pat. each $3.00 ..... 35&5%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible 35%
Jacobs' Drill Chucks 35%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws 35%
Universal, Com. Style Jaws 40%
Combination, Reversible Jaws 35%
Combination, Com. Style Jaws 40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ... 25%
Positive Drive 40%
Planer Chucks 20%
Standard 45%
Drill Press Vises 30%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ..... 35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35 .. 25%
Independent Iron, Nos. 18 and 318 .. 35%
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 25%
Union Geared Drill Chuck 25%
Universal, 11, 12, 16, 17, 13, 14, 15 .. 40%
Universal No. 42 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill 50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Scroll Combination Lathe 50%

Clamps—

Carriage Makers', Star, P., S. & W. Co. ..... 50@50&5%
Besly, Parallel ..... 33⅓&10%
Hammer & Co.:
Adjustable ..... 20&5%
Carriage Makers' H. P. Screw ..... 40&5%
Myers', Standard and Wenzelmann Hay Rack 50%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary ..... 40&5%

Cleavers, Butchers'—

Foster Bros. 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each .. $10.75
20th Century Horse, each .. $5.00
Lightning Belt Horse, each .. $15.00
Chicago Belt Horse, each .. $20.00
Stewart's Enclosed Gear Ball Bearing Horse, each $7.50
Stewart's New Model Sheep Shearing Machine, each .. $12.73
Stewart Enclosed Gear Shearing Machine, No. 8, each .. $9.75

Clips, Axle—

Regular Styles ..... 80&30&10%

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs 75%

Compasses, Dividers, &c.

Ordinary Goods ..... 75@75&5%

Conductor Pipe,—

L. C. L. to Dealers:

Gal. Steel.	Charcoal.	Copper.
Northeastern:		
70&10@—%	50&10&7½%	50&10%
Eastern:		
75@—%	50&10&7½%	50&10%
Central:		
75@—%	60%	50&10%
Northwestern:		
75@—%	60%	50&10%
Western:		
70&10@—%	50&12½%	50&5%
Tennessee:		
70&10@—%	50&12½%	50&10%
Southern:		
70&10@—%	50&12½%	50&5%
Southwestern:		
70@—%	50&5%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.: 10%

Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.30	1.60	2.00	2.30	3.00
White Enameled Lined, Side Handles: Gal.	2	3	4	6	8
Each	$2.40	2.80	3.50	4.50	5.60
Agate Lined, Side Handles: Gal.	2	3	4	6	8
Each	$3.00	3.40	4.30	5.30	6.60

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21¢; lighter than 3 lb. to pair ..... 23¢

Cord— Sash—

Braided, Drab ..... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 25¢; No. 7, 25½¢; No. 6, 26½¢.
Cable Laid Italian, lb., No. 18 .. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ..... lb., 11@11½¢
Cotton Sash Cord, Tw'ted .. 18@20¢
Patent Russia ..... lb. .... 20¢
Cable Laid Russia ..... lb. .. 21¢
India Hemp, Br'd'd ..... lb. .. 21¢
India Hemp, Twisted .. lb. 13@14¢
Patent India, Twisted .. lb. .. 17¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10 ..... ℔ lb 23¢
Pullman: 15%
Wire Sash Cord 10%
Sash Cord Attachments, per 100 .. $2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord ..... 50¢
Massachusetts, White ... ℔ lb 40¢
Massachusetts, Drab ... ℔ lb 45¢
Phoenix, White, Nos 8 to 12 .... 27¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen .... 57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length ..... 90@—%
Short Length ..... 90&20@—%
Hendryx Standard Wire Picture Cord ..... 90&10%
Turner & Stanton Co. Wire Picture Cord ..... 90&10%

Cradles—

Grain 50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zehnicker's Lumber: ℔ gro.
White and Purple, Indelible $7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black $4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16 ..... $3.00
Suremark, Black, $2.25; Blue, Red and Yellow $2.50

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847 ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ℔ doz. $3.00
Wm. Rogers & Son ..... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co. ..... 40&5%

Meat and Food—

Enterprise:

Nos.	5	10	12	22	32
Each	$1.75	$2.50	$2.25	$4	$5

25@25&7½%
No. 202, $1.50 ..... 40&7½%
P., S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant ..... ℔ doz. 40@50%

Nos.	325	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ℔ doz. $24.00.
Russwin Food, No. 1, $21.00; No. 2, $27.00; 3, $12.00 ..... 45&10&10%
$15.00 $18.00

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters 35%
Corn Graters 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife .... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—

Enterprise ..... 25@30%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00 ..... 25%
Samson, ℔ doz., $34.00 ..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, 4 to 9 in., ℔ doz. $8.25
Perfection Post Hole Diggers, ℔ doz. $8.25
Split Handle Post Hole Diggers, ℔ doz., $7.25
Hercules Pattern, ℔ doz. $8.75
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Genuine Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dressers Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ..... $1.50@1.75
Breast, Millers Falls ..... 15&10%
Breast, P., S. & W. ..... 30&10%
C. & C. Ratchet 25%
Reversible Ratchet Die Stocks 25%
Forbes Die Stocks 5%
Goodell Automatic Drills ..... 50&10&10&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $3.16.
Millers Falls Automatic Drills ..... 33⅓&10%
Noyes Repair Shop Drill No. 10 ..... 20%
Ratchet, Parker's 40%
Ratchet, Weston's, Styles A and B .. 50%
Ratchet, Weston's, Styles C, D and F 45%
Ratchet, Weston's, Style H Improved 45%
Ratchet, No. 012 ..... 50%
Ratchet, Celebrated 50%
Ratchet, Whitney's, P., S. & W. .. 50%
Star Drills 60%
Star Pipe Drills ..... 50&10%
Sebco Extension Drills ..... 40&10&5%
Star Drill Holders ..... 50&10&10%
Star Drill Points ..... 50&10&10%

Twist Drills—

Bit Stock ..... 70@70&10%
Taper and Straight Shank ..... 65@65&10%

Drivers, Screw—

Buck Bros.' Screw Driver Bits 30%
Disston's Screw Drivers, Handles and Ferrules 10%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible ..... 55&5%
Standard Neverturn 66⅔%
Star ..... 75&5%
Screw Driver Bits 25%
Fray's Hol. H'dle Sets, No. 3, $12 .. 50%
Ford's Brace Screw Drivers ..... 40&10%
Gay's Double Action Ratchet 35%
Goodell's Auto ..... 65@65&10%
Mayhew's Black Handle 45%
Mayhew's Monarch 45%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern	75&10&5%	50&10%
Eastern	80%	50&10%
Central	80&10&5%	50&10%
Northwestern	80&10&5%	50&10%
Western	80&5%	50&5%
Tennessee	80&5%	50&10%
Southern	75&10%	50&5%
Southwestern	75&10&2½%	50&5%

Terms.—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are quite general owing to market irregularities.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4 ..... 80%
Sizes 1¼, 2½, 3½, 5, 6 .. 60&10%
No. 26 ..... 50%
No. 24 ..... 25%
Copper Elbows 50%

Emery, Turkish—

	½ to 16:	5/8 to 220:	Flour.
Kegs ..... lb.	5 ¢	5½¢	5½¢
¼ Kegs..... lb.	5½¢	5¾¢	5¾¢
⅛ Kegs..... lb.	5½¢	6 ¢	6 ¢
10-lb. cans, 10 in case....	6½¢	7 ¢	8 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—

Ford's Auger Bit Extensions....40&5%

Extinguishers—Fire

Royal Mfg. Co. Fire, ₩ doz. $12.00 .....60%

Fasteners, Blind—

Upson's Patent.....25%
Walling's 50%
Zimmerman's Jap'd and Galv., 65%; Bronze and Plated.....50%

Cord and Weight—

Ives, ₩ gro., $1.08.....25%
Titan, ₩ gro., $0.96.....25%

Corrugated—

Acme Corrugated Fasteners.....70%

Faucets—

Cork Lined.....50&10@60%
Metallic Key, Leather Lined, ... 60&10@70%
Red Cedar. ... ...40&5@40&10&5%
Petroleum .....70&10@75%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring: Enterprise, Self Measuring and Pump, ₩ doz., $36.00.....40&10%
Lane's, ₩ doz., $36.00.....40&10%

Files— Domestic—

Best Brands.....70&10@75&10%
Standard Brands.....75&10@80&10%
Lower Grade....75&10&10@80&10&10%
Diston's Superfine.....67%
Fitchburg 80%
Heller Bros.....70&10@75&10%
Liveright Bros., Gold Medal.....70%
McCaffrey's American Standard. 60&10&10%
McCaffrey's Swiss Pattern.....45&10%
Simonds 70%

Fixtures, Fire Door—

Richards Mfg. Co.: Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

	15	17	19	21
Inch				
Per doz.	$3.00	3.25	3.55	4.00

Peck, Stow & Wilcox Co.:

In.	15	17	19	21	24	
	$4.00	4.40	4.75	5.50	6.50	20%

Reading Hardware Co.....50&10%

Frames— Wood Saw—

White, S'g't Bar, per doz.80@$1.00
Red, S'g't Bar, per doz.$1.00@1.80
Red, Dbl. Brace, per doz.$1.40@1.60

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fuse— *Per 1000 Feet.*

Hemp	$2.75	25&5%
Cotton	3.20	
Waterproof Sgl. Taped..	3.65	
Waterproof Dbl. Taped..	4.40	10&5%
Waterproof Tpl. Taped..	5.15	

Gates, Molasses and Oil—

Stebbins' Pattern.....60@60&5%

Gauges—

Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.: Marking, Mortise, &c.....50&50&10%
Diston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....30%
Wire, Morse's.....30%
Wire, P., S. & W. Co.....30%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.50
Spike, Metal, No. 1, $4.00; 2, $4.50
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glasses, Level—

Chapin-Stephens Co.....65@65&10%
Diston & Sons.....60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush, 25&10@50%

Grease, Axle—

Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₩ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—

Pike Mfg. Co.: Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓% Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.: Hand Power, each, Nos. 01, $1.75; 02, $2.25; 1A, $2.50; 1B $3.25...33⅓% Foot Power, No. 10, $5.00.....33⅓% Encased Gears, No. 15, Hand Power, $13.50; Combined Hand and Foot Power, $15.00.....33⅓% Lawn Mower Grinder, No. 40, $3.75 .....33⅓% Sickle Grinder, each, No. 20, $5.00 .....33⅓% Cast or Cut Gears.

Grindstones—

Pike Mfg. Co.: Improved Family Grindstones, ₩ inch, ₩ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....70&10@—%
Bridgeport Chain Co.: Triumph Coil and Halters.35&2½@40% Brown Coil and Halters...45@50&5% Brown Cow Ties.....50&5@50&10&5% Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.: Web .....30&10% Jute Rope.....55% Sisal Rope.....45% Cotton Rope.....55% Hemp Rope.....45%
Oneida Community: Am. Coil and Halters.....40@40&5% Am. Cow Ties.....45@50% Niagara Coil and Halters...45@50&5% Niagara Cow Ties.....45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'..65&10@65&10&10%
Heller's Farriers'.....40@40&10%
Peck, Stow & Wilcox Co.: Crucible Steel.....50% Farriers' .....50% Riveting .....50% Machinists' .....50% Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Victor Magnetic Tack, ₩ gro....$7.75

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢..80&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.: Long Handles.....40% D Handles.....40%

Cross-Cut Saw Handles—

Atkins' 35%
Diston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—

Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.: Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40 Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.80@$1.75
File, assorted.....gro.$1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz., 90¢ @$1; Not Varnished.....65@75¢
Plane Handles: Jack, doz., 30¢; Fore, doz....45¢
Chapin-Stephens Co.: Carving Tool.....30@30&10% Chisel .....60@60&10% File and Awl.....60@60&10% Saw and Plane.....30@30&10% Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ₩ gro. $1.25@$1.50
J. L. Osgood: Indestructible File and Tool, ₩ gro., No. 1, $8.00; No. 2, $6.50; No. 3, $5.00; No. 4, $3.50; No. 5, $18.00.....gro. lots 10%
W. A. Zelnicker Supply Co.: Hammer, ₩ doz., 12 in., $2.00; 14 in., $2.40; 16 in., $2.80; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80. Sledge, ₩ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00. Axe, ₩ doz., 28 to 34 in., $5.60; 36 in., $5.80. Adze, ₩ doz., 36 in., $5.80; 36 in., $7.80. Pick, ₩ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80. Hatchet, ₩ doz., 12 to 14 in., $2.00. — 25%

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Chicago Spring Butt Co.: Friction .....25% Oscillating .....25% Big Twin.....25%
Chisholm & Moore Mfg. Co.: Baggage Car Door.....50% Elevator .....30% Railroad 50%
Cronk & Carrier Mfg. Co.: Loose Axle.....60&10% Roller Bearing.....70%
Griffin Mfg. Co.: Solid Axle, No. 10, $12.00..60&10% Roller Bearing, No. 11, $15.00, 60&10% Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10% Bull Dog, $24.00.....70%
Lane Bros. Co.: Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25 Barn Door, Standard.....60&10% Hinged .....net $6.08 Covered .....60&5% Special .....70&5% Trolley Hangers and track...50%
Lawrence Bros.: Cleveland .....70&7½% Clipper, No. 75.....60% Crown .....55&10% Cyclone, No. 40.....net $6.60 Tandem, No. 50.....net $7.50 New York.....55&10% Trolley, No. 30, ₩ pair.....$1.25
McKinney Mfg. Co.: Roller Bearing, Nos. 1 and 2..70% Anti-Friction .....60% Hinged Hangers, King Charm.60%
F. E. Myers & Bro, Stayon; O K; O K Adjustable; Sure Grip; Sure Grip Adjustable; Sure Grip Tandem; Sure Grip Tandem Adjustable; Tandem Adjustable 60%
Richards Mfg. Co.: Hangers, Nos. 47, 48, 147, 247, 60&5% Pioneer Wood Track, No. 3..$2.25 Roller B'r'g St'l Track No. 12.$2.20 Roller B'r'g St'l Track No. 13.$2.50 Roller B'r'g, Nos. 39, 41, 43, 70&7½% Hero, Adj. Track No. 19..50&10% Adjustable Track Tandem Trolley Track No. 16.....50&10% Seal, Steel Track No. 8.....$2.25 Auto Adj. Track No. 22..50&5% Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50 Safety Underwriters F. D. No. 101 .....50% Tandem No. 41..2½ and 3 60&10% Palace, Adjustable Track No. 132 .....50&5% Royal, Adjustable Track No. 122 .....50&10% Ives' Wood Track No. 1.....$2.25 Trolley B. D. No. 20.....50&10% Trolley B. D. No. 21, $1.30; No. 27, $1.40; No. 28.....$1.60 Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½% Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60% Hinged Tandem No. 48....60&5% Folding Door B. B, Swivel No. 135 .....40%

Extra 5@10% often given.

Hangers— Garment—

Pullman Trouser, ₩ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 19, Loops.....$10.00
Victor Folding.....₩ gro. $9.60

Joist and Timber—

Lane Bros. Co.....35%

Hasps—

Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₩ doz..60%

Hatchets—

Regular list. first qual.80&10@60%
Second quality.....60@60&10%

Heaters, Carriage—

Clark, No. 5, $1.25; No. 5R, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 1, $3.00 .....25%
Big Hit Assortment, ₩ case...$13.80
Leader, ₩ case.....$9.00
Clark Coal, doz.....$0.75
A B C Coal, doz.....$0.60
Sadiron Coal, box 50 pieces.....$0.75

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.00.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co. Hale & Benjamin Automatic Blind Hinges .....20% Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....50&10%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₩ doz. sets, without screws, $1.00; with screws, $1.30.
Wrightsville Hardware Co.: O. S., Lull & Porter.....75&5% Acme, Lull & Porter.....75% Queen City Reversible.....75% Shepard's Noiseless, Nos. 60, 65, 55 .....75&5% Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5% Clark's O. P., No. 1.....75&10% Clark's O. P., Nos. 3 and 5....75&5% Tip Pat'n, No. 1.....75&10% Clark's No. 3.....75&5% Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5% Shepard's Double Locking.....75% Champion Gravity Locking.....75&5% Pioneer .....75&10% Empire .....65% W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only	1.25	1.90	3.50
Latches only	.70	.75	.35

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.: Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—

Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₩ doz. prs.....$1.00

Pivot Hinges—

Bommer Bros, Pivot, Ball Bearing 40%
Lawson Mfg. Co., Matchless..50&10%

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley: Simplex Spring Hinges.....40% Bardsley's Patent Checking.33⅓%
Bommer Bros.: Spring Butt Hinges.....40% Surface Floor, Ball Bearing .....40% Mortise Floor, Ball Bearing.40% Lavatory Hinges.....40% Non-Holdback Screen Door, Nos. 2000 and 900.....40% Holdback Screen Door, No. 999.....₩ gro, $9.00
Chicago Spring Butt Co.: Chicago Spring Hinges.....25% Triplex Spring Hinges.....50% Chicago (Ball Bearing) Floor.50% Chicago Engine House.....25% Lavatory Door Hinges.....50% Adjustable Screen Door.....60% Non-Holdback 65%
Lawson Mfg. Co.: Matchless Spring Hinges..... 30&10&10% Matchless Jamb Hinges..... 30&10&10% Lavatory .....50&10% Surface Floor.....60&10%
Richards Mfg. Co.: Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.: Buckeye All Steel Holdback Screen Door.....₩ gr. $9.00 Chief Ball Bearings Floor Hinge .....50% Ball Bearing Door.....25% No. 777, Sheet Steel Holdb'k. ₩ gr. pr.....$9.00
Superior Spring Hinge Co.: Superior Floor Hinges.....40% Spring Hinges.....40%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c.: Light Strap Hinges....65% Heavy Strap Hinges....75% Light T Hinges.....60% Heavy T Hinges....40&10% Extra Hvy. T Hinges.65&10% Hinge Hasps.....40% Cor. Heavy Strap.....75% Cor. Ex. Heavy T...65&10%

Extra, 5@—

Screw Hook and Strap. { 6 to 12 in..lb. 3½¢ ; 14 to 20 in..lb. 3½¢ ; 22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
⅝ to 1 inch.....lb. 5½¢
⅞-inch .....lb. 6½¢
½-inch .....lb. 8½¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.30&10%

Hods— Coal—

Net, per gross.

Inch	*15*	*16*	*17*	*18*
Galv., Open	$24.85	27.75	29.85	32.65
Jap., Open	18.45	19.85	22.00	24.85
Gal., Funnel	30.50	34.00	36.90	39.75
Jap., Funnel	23.45	25.55	27.70	30.40

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye-

Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%

Handled—

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Broom—

Pullman Broom, ₱ gro.....$9.00

Door—

Bardsley's, Iron, 40%; Bronze.....20%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....40%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ doz.$2.00

Nipple—

Curtis Nipple Holders.....5%

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast—

Bird Cage, Reading.....50%
Clothes Line, Reading List.....50&5%
Coat and Hat Iron, Reading.....50%
Coat and Hat, Bronze Metal, Reading.....33⅓%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....50%

Wire—

Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 75@75&10%; Crown, 75&10@80%; Czar, 70%; Capitol 80%; Czar Harness, 50&10%; Ceiling, 75@80%.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, boat, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....25%
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons— Sad—

From 4 to 10.....lb. 8½@8¾¢
Mrs. Potts', cents per set:

	Nos. 50	*55*	*60*	*65*
Jap'd Cups	88	88	88	93
Tin'd Cups	91	88	1.01	98

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&10%; Steel, 50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..40%

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%

Drawing—

Standard, List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....₱ doz. $9.00
Iwan's Serrated.....₱ doz. $9.50

Miscellaneous—

Farriers' .....doz. $2.60@3.55

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door and Shutters, 10@15%

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co.'s list, Melting and Plumbers'.....25%
P., S. & W.....40&10%
Reading.....50&10%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular—

Regular, No. 0....doz. $4.00@4.50
Side Lift, No. 0...doz. $4.25@4.75
Hinge Globe, No. 0. doz. $4.25@4.75
Other Styles.....40&5%

Bull's Eye Police—

3-inch .....$3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws .....doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.: Cotton, 55%; Hemp, 45%; Jute, 55%; Sisal, 45%.

Lifters, Transom—

Reading, Iron, 50&5%; Bronze Metal.....33⅓%
R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	$2.30	1.95	1.75
75 feet	$1.95	1.65	1.50

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 30%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....50%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....30%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....40%
Shade Cord, Cotton or Linen....30%

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓@35%

Door Locks, Latches, &c —

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....33⅓
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Crescent.....25%
Automatic Gravity Metal Sash, ₱ gro., $149.58.....25%
Window Ventilating.....25%
Pullman Patent Ventilating Lock..75%
Reading Sash Locks, Iron.....50%
Reading Sash Locks, Bronze Metal, 33⅓%

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—

Reisinger Invincible Hand Power... ₱ doz. $48.00

Forming, Bending, Etc—

Royal Forming, Bending, Crimping and Fluting, Hand Power, each, $20.00.....40%

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%
Everlasting Flexible Steel.....40%

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee.....20@25%
Bone, Shell and Corn.....25&10%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade	$4.50	4.75	5.00	5.25

Continental, High and Low Wheel, 50&10%
Great American.....66⅔%
Great American Ball Bearing....66⅔%
Quaker City.....66⅔%
Pennsylvania, High and Low Wheel, 50&10%
Pennsylvania, Jr., Ball Bearing, 50&5%
Pennsylvania Golf, 6 Knives, Low Wheel, 33⅓%; High Wheel.....45%
Pennsylvania Golf, Ball Bearing, 7 Knives, High Wheel.....33⅓%
Pennsylvania Horse, 30 and 38 inch, 33⅓&5%
Pennsylvania Pony or Two Man.40&5%
Pennsylvania Grand Horse, 30 and 38 in.....33⅓%

Nails—

Wire Nails and Brads, Miscellaneous .....85&5@85&10%
Cut and Wire, See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	*2*	*2½*	*3 in.*
Brass Hd, gro.	.45	.55	.60	.70
Por. Head, gro.	1.10	1.10	1.10	

Upholsters—

Brass.....30%
Plated.....30&10%

Nuts— *Blank or Tapped.*

Cold Punched: *Off list.*
Square.....5.20¢
Hexagon.....5.80¢
Square, C., T. & R......5.60¢
Hexagon, C., T. & R......6.40¢
Hot Pressed: Off list.
Square.....5.60¢
Hexagon.....6.10¢

Oakum—

Best.....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy.....lb. 5 ¢
Plumbers' Spun Oakum..3¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10@70%
Railroad.....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, etc.....60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers, Can—

Triumph Shear Can Openers, doz..$1.20

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....13¢

Rubber—

(Fair quality goods.)
Sheet, C. I......11@12¢
Sheet, C. O. S......11@12¢
Sheet, C. B. S......12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₱ lb., 80¢.....25%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute.....lb. 4@4½¢
Russia Packing.....lb. 9@10¢

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List.....75&10@80%

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	$1.75	2.25	2.90	3.15

Paper—Building Paper

Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll.32¢
Medium weight, 30 lbs. to roll, 45¢
Heavy weight, 40 lbs. to roll.60¢
Black Water Proof Sheathing, 500 sq. ft., light weight, 65¢; medium weight, 95¢; heavy weight, $1.30.
Deafening Felt, 9 and 6 sq. ft. to lb., ton.....$40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton, carloads, $31.00; less than carloads.....$32.00
2 ply, (roll 108 sq. ft.), 40 lb..48¢
3 ply (roll 108 sq. ft.), 60 lb..68¢
Slater's Felt (roll 500 sq. ft.). per ton, $35.00; per roll.....70¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—

Goodell Co.:
Family Bay State.....⅌ doz. $15.00
Improved Bay State.....⅌ doz. $36.00
New Lightning.....⅌ doz. $7.00
Turn Table '98.....⅌ doz. $6.00
White Mountain.....⅌ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
New Century.....each $20.00
Ranger.....each $25.00
Rapid Apple Slicer.....each $100.00
Reading Hardware Co.:
Advance.....⅌ doz. $4.00
Baldwin.....⅌ doz. $4.00
Reading 72.....⅌ doz. $3.25
Reading 78.....⅌ doz. $6.25

Orange—

Goodell Co., Success.....each $20.00

Potato—

Saratoga.....⅌ doz. $7.00
White Mountain.....⅌ doz. $6.00

Picks and Mattocks—

List.....75&10%
Cronk's Handled Garden Mattock, ⅌ doz., $6.00.....33⅓%

Pins, Escutcheon—

Brass.....50@50&10%
Iron.....60@60&10%

Pipe, Cast Iron Soil—

Eastern Prices:
Standard, 2-6 in......68% } Extra 10 & 10&5%
Extra Heavy, 2-6 in.....74% }
Fittings, Standard and Heavy.....80¾%

Pipe, Merchant—

Carloads to Consumers:

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in..				
⅜ in.....				
½ in.....				
¾ to 6 in....				
7 to 12 in....				

See Trade Report

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class.....85%
Second-class.....87½

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$5.90	$6.90
6 in., Uniform Color..	6.40	7.40
7 in., Uniform Color..	7.40	8.40

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....30@30&5%
Bench, second qual....40@40&5%
Molding.....25@25&5%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union.....60%

Iron Planes

Union.....60%

Plane Irons—

Wood Bench Plane Irons....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union.....50%
L. & I. J. White.....25&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....⅌ doz. $7.50

Plates—

Felloe.....lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—

Never-Break.....75&10%

Pliers and Nippers

Button Pliers.....75&5@75&10%
Gas Burner, per doz., 5 in., $1.25 @$1.50; 6 in., $1.45, $1.50.

Gas pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's.....60%
No. 99 Linemen's.....50%
Stub's Pattern.....60%
Combination and others.....33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers.....70%
Wire and Cutting Pliers.....70%
Heller's Farriers' Nippers, Pincers and Tools.....40@40&10%
P., S. & W. Tinners' Cutting Nippers.....20%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston & Sons:
Shafting Levels.....60&10%
Pocket Levels.....60&10%
Plumbs and Levels.....60&10%
Track Level and Gauge.....60&10%

Points, Glaziers'—

Bulk and 1-lb. papers....7lb. 9 ¢
½-lb. papers.....lb. 9½¢
¼-lb. papers.....7lb. 10 ¢

Police Goods—

Manufacturers' Lists..25@25&5%

Polish—Metal, Etc—

Ladd Co.:
Putzade Liquid, ⅌ gro., ½ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ⅌ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ⅌ doz., $3.00; No. 2 (1 qu.), $5.00..40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ⅌ doz. 50¢; ⅌ gro. $4.50; ½ lb boxes, ⅌ doz. $1.25; 1 lb boxes, ⅌ doz. $2.25.
U. S. Liquid, 8 oz. cans, ⅌ doz., $1.25.
Barkeepers' Friend Metal Polish, ⅌ doz., $1.75.

Stove—

Black Eagle Benzine Paste, 5 lb cans, ⅌ lb 10¢
Black Eagle, Liquid, ½ pt, cans.. ⅌ doz. 75¢
Black Jack Paste, ¾ lb cans, ⅌ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon, ⅌ gr. $5.75.....10%
Dixon's Plumbago.....⅌ lb 8¢
Fireside.....⅌ gr. $2.50
Gem, ⅌ gr. $4.50.....10%
Japanese.....⅌ gr. $3.50
Jet Black.....⅌ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ⅌ doz. $1.50

Window Polish—

Benj. P. Forbes:
Glasbright, 1 lb cans, each.....75¢
Glasbright, Factory, 10 lb pails, ⅌ lb.....25¢

Poppers, Corn—

1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.20; gro..$12.00
2 qt. Square..doz.$1.50; gro..$15.00

Pots, Glue—

Enameled.....40%
Tinned.....30&10%

Powder—

Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
} Discount to the trade, 10%.

NOTE.—Prices vary according to territory.

Presses—

Enterprise Mfg. Co., Fruit, Wine and Jelly.....20@25%
Lard Presses and Sausage Stuffers.....25@25&7½%

Seal Presses—

Morrill's No. 1, ⅌ doz., $20.00.....50%
Morrill's Pocket, $30.00.....50%

Pruning Hooks and Shears

See *Shears*.

Pullers, Nail, Etc.—

Elmore Tool Mfg. Co.:
Drop Forged Tack Claws....50&10%
Standard Tack Claws, No. 10.....33⅓&7½%
Nail Pullers.....40%
Miller's Falls, No. 3, ⅌ doz., $12.00..... 33⅓&10%
Morrill's No. 1, Nail Puller, ⅌ doz. $20.00.....50%
Pearson Spike Puller, each, $15.00..25%
Parrot Tack and Stab Pullers, ⅌ doz.....$1.20
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch.....	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.80
Inch.....	1½	1¾	2	2½

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in. .20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle.....50&10%
Wrought Steel, Eagle, ⅌ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in.....27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ⅌ doz.....19¢
Common Sense, ⅌ doz. 20¢
Merit, ⅌ doz., 2¼ in.....37¢
Fox-All-Steel, Nos. 3 and 7, 2 in..... ⅌ doz. 50¢
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—

Cistern.....60%
Pitcher Spout.....75&10&5@80
Wood Pumps, Tubing, &c....50%
Barnes Mfg. Co.:
Dbl. Acting (low list).....50%
Pitcher Spout.....80%
Daisy Spray Pump.....⅌ doz. $6.50
Goulds Mfg. Co.:
Double-Acting Thresher Tank..$5.00
Diaphragm No. 3, Side Suction.$14.50
Empire, Advance, Seneca, D, A, Shallow and Deep Well (low list).....50%
Spraying and Whitewashing.....$2.45
F. E. Myers & Bros. (low lists):
Double Acting Force and Lift; Cistern and Well; House; Windmill; Ratchet Handle; Pump Stands; Hydro-Pneumatic; Bulldozer Power; Spray; Ashland Force and Lift.....50%
Thresher Tank—Myers and Faultless Low Down Tank.....$5.00
Century Low Down Tank, No. 470.....$5.25
Century Low Down Ratchet Handle Tank, No. R470.....$5.50

Pump Attachments—

Chicago Hdw. & Fdy. Pump Spout Attachments, each.....$0.27

Pump Leathers—

Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*
	$5.00	6.00	7.00	8.00

Cup Leathers—Per 100:

Inch....	2½	3	3½	4
	$5.00	7.00	9.00	12.00

} 50%&50&5%

Punches—

Saddlers' or Drive, good, doz.50@75¢
Spring, single tube, good quality.....$1.75
Revolving (4 tubes)....doz.$3.50
Remis & Call Co.'s Cast St'l Drive.50%
Elmore Tool Mfg. Co.:
Machinists' Center.....40%
Tinners': Solid, 50%; Prick.....30%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55%
Tinners' Hollow, P., S. & W. Co..25%
Tinners' Solid, P., S. & W. Co., ⅌ doz., $1.44.....40&10%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....50%
Cronk's:
Double Braced Steel Rail..⅌ ft. 2¾¢
O. N. T. Rail.....2¼¢
Griffin's:
XXX, ⅌ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ⅌ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ⅌ 100 ft.....$3.45
O. N. T., ⅌ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....⅌ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ⅌ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
Trolley, No. 301, ⅌ ft.....9¢
McKinney's:
Hinged Hanger Track, ⅌ ft., 11¢ 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&10%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ⅌ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 65, $3.25; 66, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.00.

Rakes—

Cronk's:
Steel Garden: Champion, ⅌ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ⅌ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ⅌ doz., 20 teeth, $2.35; 24, $2.50.....net
Anticlog Lawn, ⅌ doz.....$3.50
Malleable Garden.....70&10%
Ideal Steel Garden, ⅌ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Jumbo Lawn, 36-tooth....⅌ doz. $5.00
Lawn Queen, 20-tooth....⅌ doz. $2.65
Lawn Queen, 24-tooth....⅌ doz. $2.75
Paragon, 20-tooth.....⅌ doz. $2.40
Paragon, 24-tooth.....⅌ doz. $2.50
Steel Garden, 14-tooth....⅌ doz. $2.40
Malleable Garden, 14-tooth, ⅌ doz. $1.75@$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.....70%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

W. H. Compton Shear Co.....30%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo..Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 66 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 30 PN.....20%
2904 P, 33¼%; 2904 PN, 33¼%; 0024 N, 33¼%; 92084 N, 33¼%; 002904 PN, 33¼%; 802 N, 33¼%; 986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
3M P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—

Japanned, Electroplated and Bronzed.....70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal.40%

Revolvers—

Single Action.....$5¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber...$2.00
Automatic.....$4.00
Hammerless.....$4.50

Riddles, Hardware Grade

16 in.....*per doz.*$2.50@$2.75
17 in.....*per doz.*$2.75@$3.00
18 in.....*per doz.*$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel.....	$0.70	0.75	0.80 doz.
Copper.....	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—

Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz.85@95¢
Blair's Rings..per gro.$5.50@$6.00
Blair's Ringers..per doz.65@70¢

Rivets—

Copper Rivets and Burrs, 50@50&10%
Tinners' and Miscellaneous Rivets.....80&5%

Bifurcated and Tubular—

Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@ 65¢.
Tubular, per doz. boxes, 50 count, 60@65¢; 100 count, $1.12@$1.26.

Rollers—

Cronk's Stay, No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Myers' Stay.....60%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—

Manila, 7-16 in. diam. and larger:
Highest Grade.....lb. 8¼@8½¢
Lower Grades.
Sisal, 7-16 in. diam. and larger:
Highest Grade.....lb. 7½@7¾¢
Commercial Grade.....lb. 6½¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Pure.....lb. 7¾@8¢

Sisal, Tarred, Medium Lath Yarn:
Pure ..... *lb.* 6¾@7¢

Cotton Rope:
Best, ¼-in. and larger. 16½@20¢
Medium, ¼-in. and larger. 15@16¢
Common, ¼-in. and larger.. 7½¢
In coils, ½¢ advance.

Jute Rope:
Rove, No. 1, ¼-in. and up.
lb. ..... 5@5½¢

Wire Rope—

Galvanized ..... 77½&2½%
Plain ..... 55&2½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, $0.75@$0.83; Sisal....$0.82@$0.90

Rules

Boxwood ..... 60&5%
Ivory ..... 25&5%

Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%

Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%

Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Upson Nut Co.:
Upson Nut Co., Boxwood ..... 60&5%

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%

Chapin-Stephens Co.:
Turning Saws and Frames. 30@30&10%

Disston's:
Circular, Solid and Ins'ted Tooth. 50%
Band, 2 to 18 in. wide 60%
Band, ⅛ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 40%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Hand Ice Saws 45%
Butcher Saws and Blades 30%

C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%

Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%

Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws. 30%

Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws. 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws. 40%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand.... 45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws ..... 40&7½%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..40%
Disston's:
Concave Blades 25%
Chromol Blades 35%
Hack Saw Frames 30%
Simonds, 35%; Bay State, 40%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.... 40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Griffin Co. Hack Saw Blades..... 50%
Star Hack Saws and Blades....15&10%
Sterling Hack Saw Blades..30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Victor Hack Saw Machines, each. $75.00

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 25%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.00 and $4.00.. 15&10%

Scales—

Union Platform, Plain. $2.10@2.20
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
Reading Hardware Co. ..... 50&5%
The Standard Portables 40%
The Standard R. R. and Wag- ...

Scrapers—

Chapin-Stephens Co., Box..30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@4.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood....70&10@70&10&10%
Chapin-Stephens Co., Hand..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point..... 75&10&10%
Coach, Gimlet Point..75&10&5%
Hand Rail..... 70&10@75%

Jack Screws—

Standard List..... 70&10@75%
Millers Falls..... 50&10&10%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50&50&10%
Fillister Head..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14..... 65&10%

Set and Cap—

Set (Iron)..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap..... 70&10&7½%
Hex. Hd. Cap..... 70&10&7½%
Rd. Hd. Cap..... 50&7½%
Fillister Hd. Cap..... 60&7½%

Wood—

List July 23, 1903.

Flat Head, Iron.....87½&5@..%
Round Head, Iron....85&5@..%
Flat Head, Brass.....80&5@..%
Round Head, Brass..77½&5@..%
Flat Head, Bronze....75&5@..%
*Round Head, Bronze.*72½&5@..%
Drive Screws.....87½&5@..%

Scythes— *Per doz.*

Plain Grass, Cutting Edge Polished ..... $6.25@$6.50
Clipper, Bronzed Web .$6.50@$6.75
Solid Steel, Web and Backs Polished ..... $7.00@$7.25
Bush, Weed and Bramble, Painted ..... $6.50@$6.75
Grain, Painted, Cutting Edge Polished ..... $8.25@$8.50
Clipper Grain, Bronze Web. $8.50@$8.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Hollow Tool Handles, Nos. 1, $12; 2, $16; 3, $12..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $15...20&10%

Sets, Nail—

Octagon ..... *gro.* $3.50@3.75
Buck Bros..... 27½%
Elmore Tool Mfg. Co..... 30%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt.....40&10%
Snell's Knurled, Cup Pt.....40&10%
Victor Knurled, Cup Pt....℔ gro. $7.50

Rivet—

Regular list..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut....℔ doz. $6.00
Morrill's No. 1..... $15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5, Mill..... $30.00
Nos. 10, 11, 95..... $15.60
No. 1 Old Style..... $10.00
Special $16.25
Royal, Hand..... ℔ doz. $3.50
Seymour Smith & Son's..... 65%
Taintor Positive..... ℔ doz. $6.75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz..... $1.50
Mounted Kitchen Sand Stone, ℔ doz..... $1.50
Natural Grit Carving Knife Hones, ℔ doz..... $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz..... $1.50
Quick Edge Pocket Knife Hones, ℔ doz..... $2.50

Lawn Mower—

Pike Mfg. Co. 12, 14, 16, 18 and 20 in., doz.. $6.00..... 33⅓%

Shavers, Beef—

Enterprise Mfg. Co..... 25@30%

Shaves, Spoke—

Iron ..... *doz.* $1.25
Wood ..... *doz.* $2.00
Chapin-Stephens Co..... 30@30&10%
Millers Falls Co., ℔ doz., $9.00.15&10%
Seymour Smith & Son's..... 30%

Shears—

	7	8	9 in.	
Cast Iron..				
Best ...	$16.00	18.00	20.00	*gro.*
Good ...	$13.00	15.00	17.00	*gro.*
Cheap ..	$5.00	6.00	7.00	*gro.*

Straight Trimmers, &c.:
Best quality Jap.....70&10&5%
Best Quality Nickel..60&10&5%
Tailors' Shears..... 40@40&10%
Acme Cast Shears..... 40%
Columbian Cutlery Co.:
Sheep, 1900 list..... 30&10&5%
Grass ..... 50&10%
Horse or Mule..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel..... 50&10&5%
Tailors' 30%
J. Wiss & Sons Co.:
Best Quality Jap'd..... 60&10%
Best Quality Nickeled..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades..... 20&5@20&10%
Steel Laid Blades..... 50&10%
Acme Cast Snips..... 40%
W. H. Compton Shear Co., Forged Steel Handles..... 35%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in..... 33⅓&7½%
Niagara Snips..... 40%
P., S. & W. Forged Handles 25%
Forged Handles, Steel Blades, Samson ..... 40@40&5%
Triumph Stove Pipe, doz..... $6.00
J. Wiss & Sons Co.:
Wiss Forged Steel..... 25%

Pruning Shears—

Columbian Cutlery Co.:
Hedge, Wilcut Brand..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%
W. H. Compton Shear Co., Dropped Forged Steel..... 35%
Cronk's Hand Shears..... 33⅓%
Cronk's Wood Handle Shears.... 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz, $18.00..... 25%
Disston's Pruning Hook only, ℔ doz., $12.00..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades..... 40%
P., S. & W. Co..... 40%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners..... 75&10%
Wood Handle Pruning Shears.... 40%

Sheaves—Sliding Door—

Reading 40%
R. & E. list..... 15%

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 15%

Shells—Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Arrow, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
New Club, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Nitro Club, 10, 12, 16 and 20 gauge; New Club, 14, 16 and 20 gauge; Repeater Grade..... 20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade..... 40&5%
Loaded with Smokeless Powder, high grade..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders..... 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade..... 40&5%
Smokeless Leader Grade...40&10&10%
Black Powder..... 40%

Shingles, Metal— Per Sq.

Wheeling Corrugating Co.:
Dixie, 14 x 20 in....$4.05 $5.05
Dixie, 10 x 14 in.... 4.25 5.45
Dixie, 7 x 10 in.... 5.25 6.70

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... *per keg.* $4.10
Steel ..... *per keg.* $3.85
Burden's, all sizes..... ℔ keg $3.90

Shot—

25-lb. bag.
Drop, up to B..... $1.70
Drop, B and larger..... 1.95
Buck 1.95
Chilled 1.85
Dust 2.30

Shovels and Spades—

Association List..40&7½@40&10%
Avery Stamping Co..... 40%

Snow Shovels—

Long Handle..... $2.50@$2.75
Wood and Mail, D Handle, $2.65@$2.90

Sieves and Sifters—

Hunter's Imitation, gro..... $9.50
Hunter's Genuine, per gro.. $12.00

Sieves, Seamless Metallic

Per dozen.

Mesh	12	16	18	20
Iron Wire....	$1.05	1.05	1.10	1.20
Tinned Wire..	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested.... *doz.* $0.90@0.95
Mesh 20, Nested.... *doz.* $1.00@1.05
Mesh 24, Nested.... *doz.* $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in..... 60%
20 x 24 to 24 x 50 in..... 50%
24 x 60 to 24 x 120 in..... 30%
Barnes' low list, all sizes up to 20 x 40, 60%; larger sizes..... 55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Steel—

Steel Sinks, L. & G. list..... 60%

Skeins, Wagon—

Cast Iron..... 70@70&10%
Steel ..... 35@40%

Slates, School—

Factory Shipments.
"D" Slates..... 50@50&10%
Eureka, Unexcelled Noiseless.. 60&7 tens.
Victor A, Noiseless.60&4 tens 45%

Sleds—

Little Giant Folding, ℔ doz..... $12.00

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Polo, King..... 25&10%
High Grade, Covert, Trojan..... 30&10&10%
Yankee, Queen, Yankee Roller..... 30&10%

Snaths—

Grass Scythe..... 50@50&5%

Spoons and Forks—

Silver Plated—

Good Quality..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous

German Silver..... 60@60&5%

Tinned Iron—

Teas ..... *per gro.* 50@55¢
Tables ..... *per gro.* $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check..... 33⅓%
Chicago (Coil)..... 40&10%
Pullman Door (Coil), ℔ gro..... $10.00
Pullman Gate..... 10%
Reliance (Coil)..... 40&10%

Carriage, Wagon, &c.—

	Per 100 lb.
1¼ in. and Wider: Black	$1.75@$2.00
Half Bright.....	$1.75@$2.00
Bright	$2.25@$2.50

Painted Seat Springs:
1½ x 2 x 26....*per pair*. 45@47¢
1½ x 3 x 28....*per pair*. 68@71¢

Sprinklers, Lawn—

Enterprise ..... 25@30%
Hero Fruit Jar Co., ℔ doz..... $4.50
Philadelphia No. 1, ℔ doz, $12; No. 2, $15; No. 3, $20..... 30%

Squares—

Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron.. } *80@ 0&5%*
Rosewood Hdl. Try Squares and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, 60&10%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... *doz.* $1.00
Good Grade..... *doz.* $1.25
Tinned Iron..... *doz.* $0.75@$1.00
Iron, Porcelain Lined...*doz.* $1.75
Victor, ℔ gro..... $9.00

Staples—

Barbed Blind..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $1.80; Galvanized *$2.10*
Poultry Netting Staples..... *per lb.* 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' .....40@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Greeu River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plate.....25%

Stoners, Cherry—

Enterprise .....24@30%

Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies.....40%

Stones, Oil, &c.—

Pike Mfg. Co., 1907 list: ₩ lb
Arkansas St. No. 1, 3 to 5½ in..$2.80
Arkansas St. No. 1, 5½ to 8 in..$3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in..60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..25¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)...33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....40%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, R'g'lar. ₩ lb 8¢
Hindostan No. 1, Small..₩ lb 10¢
Turkey Oil Stones, Extra, 5 to 8 in.....₩ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S..₩ gro, $12.00
Lamoille S. S.....₩ gro, $11.00
White Mountain S. S.₩ gro. $9.50
Green Mountain S. S.₩ gro. $7.00
Extra Indian Pond S.S.₩ gro. $8.00
No. 1 Indian Pond S.S.₩ gro, $7.50
No. 2 Indian Pond S.S.₩ gro, $5.00
Leader Red End S. S.₩ gro, $5.00
Quick Cut Emery....₩ gro. $10.00
Pure Corundum.....₩ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat.$11.00
Emery Scythe Rifles, 4 Coat.$13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ₩ gro., $12.00.33⅓%
$12.00 .....33⅓%
Lightning (Artificial), ₩ gro. $18.00 .....33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₩ gro. $2.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₩ doz., No. 1, $10.00....50%
Morrill's, No. 2, $12.50.....50%
Seymour Smith & Son's.....60%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stevens Co.....20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots...20&10&10%

Stroppers, Razor—

Pullman Safety Razor Blade, doz.$3.50

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses.....25@25&7½%
P., S. & W. Co.....40&10&5%

Swings, Lawn—

Myers' Low Down Roller.....$6.25

Tacks, Finishing Nails, &c.

American Carpet Tacks.90@25@—%
American Cut Tacks..90@25@—%
Swedes' Cut Tacks.L..90@30@—%
Swedes' Upholsterers'.90@35@—%
Gimp Tacks.....90@35@—%
Lace Tacks.....90@35@—%
Trimmers' Tacks.....90@30@—%
Looking Glass Tacks.....65@—%
Bill Posters' and Railroad Tacks, 90@40@—%
Hungarian Nails.....80@—%
Finishing Nails.....70@—%
Trunk and Clout Nails.75@50@—%
NOTE.—The above prices are for Straight Weights
See also Nails, Wire.

Double Pointed—

Double Pointed Tacks, 90@65 tens@—%

Tapes, Measuring—

American Asses' Skin....50@—%
Patent Leather.....25@30@5%
Steel .....33⅓@5%
Chesterman's .....25@33⅓@5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@ 35&5%; Pocket, 35@35&5%.

Lufkins:
Asses' Skin.....10&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@33%
Wiebusch & Hilger:
Chesterman's Metallic, No. 3ML, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lb.....$2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@35%

Ties, Bale—Steel Wire—

Single Loop.....82½&10%
Monitor, Cross Head, &c.70.&2½%

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tops, Chimney—

Iwan Volcano Chimney Tops.....55%

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Ice Tools—

Gifford-Wood Co.....15%

Saw—

Atkins' Cross Cut Saw Tools.....35%
Simond's Improved.....33⅓%
Simonds' Crescent.....30%

Ship—

L. & I. J. White.....25%

Torches—

Hammers, Engine, ₩ doz.....$4.50

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro.$13.00@13.50

Game—

Imitation Oneida.....75@10%
Newhouse .....50&5%
Hawley & Norton.....65&10%
Victor .....75@75&10%
Oneida Community Jump.....70&5%
Stop Thief.....60%
Tree Trap.....60%
Hector .....75@75&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₩ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Forged Steel Garden Trowels, in 1 doz. boxes, ₩ gro. $6.50
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

McKinney Trucks.....each, net $10.00

Tubs, Wash—

Net, per gross.

	No. 0	1	2	3
Galvanized	$43	$51	$59	$66

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ⅛-lb. Balls..21@23¢
No. 12, ¼ and ⅛-lb. Balls..19@21¢
No. 18, ¼ and ⅛-lb. Balls..16@18¢
No. 24, ¼ and ⅛ -lb. Balls, 15½@17½¢
No. 36, ¼ and ⅛-lb. Balls..15@17¢
Chalk Line, Cotton ¼-lb. Balls .....21@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....8½@21¢
Cotton Wrapping, 5 Balls to lb., according to quality..13½@21¢
American 2-Ply Hemp, ¼ and ⅛-lb. Balls.....18½@18¢
American 3-Ply Hemp, 1-lb Balls .....13½@16¢
India, 2-Ply Hemp, 1⅛-lb. Balls, Balls (Spring Twine)..7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7½@9¢
India 5-Ply Hemp, 1½-lb. Balls, 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls .....9@11¢
Mason Line, Linen, ½-lb. Bls.47¢
No. 263 Mattress, ¼ and ½ lb. Balls, according to quality, 50@60¢
Wool, 3 to 6 ply....B 6¢; A 7½¢

Vises—

Solid Box.....60@60&10%

Parallel—

Fisher & Norris Double Screw Leg, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00.....20%
Fisher-Brooks Bench and Woodworkers' Vises, No. 0, $3.80; No. 1, $5.00; No. 2, $8.25; No. 3, $10.50; No. 4, $13.50.....40%
Morrill's 25%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss Vise Co.:
Patent, Bicycle, Shepard, Gipsy, Adj. Column, Lewis Adj. Jaw..25%
Rapid Transit, Heavy Chipping..30%
Bull Dog, Anchor Line, Yankee Quick Lever, Lewis Solid Jaw, Eclipse Wrench Attachment...40%
Monarch 45%
Vise Jaw Caps 10%
Pullman Automatic Bench, ₩ doz., No. 1, $7.50; No. 2.....$9.50

Pipe—

Curtis & Curtis Malleable.....25%
Parker's Combination:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Prentiss Vise Co.:
Blake Combination, Prentiss Combination, Prentiss.....60%
Malleable; Monarch Combination 65%
Rex Combination.....70%
Peerless Pipe Grip.....25%

Saw Filers

Disston's D 3 Clamp and Guide, ₩ doz., $24.00, 30%; Clamps.....30%
Reading .....50&10%

Wood Workers—

Prentiss Cabinet Makers'.....40%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E.,11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25
Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs .....$2.75@$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
El-an-ge .....60&10%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles .....65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd.....60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles .....65&5%
Solid Steel Kettles.....60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

No. ₩ doz.
800—Brass King, Single Surface, Open Back.....$3.00
801—Brass King, Single Surface, Open Back.....$2.50
802—Brass Junior, Single Surface, Open Back.....$2.25
862—White Hen, Spiral Crimp Glass $3.15
964—Royal Blue Enamel, Single Surface, Ventilated Back.....$3.25
172—Our Best, Single Zinc, Soap Drainer $3.25
722—Soap Saver, Single Zinc, Iron Top $3.35
100—Northern Queen, Single Zinc, Perforated, Open Back.....$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back....$2.80
710—Regal, Single Zinc, Extra Family Size, Ventilated Back.....$2.50
700—Banner Globe, Single Zinc, Ventilated Back.....$2.25
57—Peerless, Double Zinc, Spring Protector $3.70
56—Red Cross, Double Zinc, Swing Protector $3.60
17—North Star, Solid Zinc, Swing Protector $3.63
797—Jewel, Single Zinc, Pail Size.$1.25

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil: ⅜ 9¢ | *1* 10¢ | *1⅛* 11¢ | *1¼ inch.* 14¢ *per box.*

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.90 4.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ¼¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ₩ 100 lb. discl.; in 100 lb kegs, add 10¢ net ₩ 100 lb; in 5 or 10 lb boxes, add 50¢ net ₩ 100 lb; in 1 lb boxes, add $1.00 net ₩ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish.....lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co.....25%

Sash—

Per net ton.....$24.00@$25.00

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 15%

Well—

8-in., $3.00; 10-in., $3.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Market and Stone Wire in Bundles—

Bright and Annealed:
9 and coarser.....80%
10 to 18.....80&10%
19 to 26.....80&10&2½%
27 to 36.....80&5%
Galvanized:
9 and coarser.....75&10%
10 to 16.....75&10%
17 to 26.....72½&10%
27 to 36.....72½%
Coppered:
9 and coarser.....75&10%
10 to 26.....75&10%
27 to 36.....70&10&5%
Tinned:
6 to 18.....75&10&10%
Brass.....15¾¢ lb., base
Copper.....1⅛/10¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10&10&10%
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box, $1.90@$2.10

Bright Wire Goods—

Steel Wire Goods.....90&35%
Brass Wire Goods.....90&35%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75&10@80&5%
Alligator or Crocodile.70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut.....50&5%
Combination Black.....50&5%
Merrick Pattern.....50&5%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Hercules 70%
W. & B. Machinist:
Case lots.....50&10%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W..50&10%
Full cases.....50&10&5%
Vulcan and Agrippa Chain.....50%
Wizard Adjustable Ratchet.....50%

Can and Jar—

Benj. P. Forbes Triumph, doz., $0.75; Triumph Syrup Cap, gro. $4.00

Wrought Goods—

Staple Hooks, &c., list March 11, '02.....90@—%

Zinc—

(Cask lots, 600 lb., at mill.)
Sheet.....per 100 lb., $7.50

For the Table of "Current Metal Prices" see the First Issue of Every Month.

THE IRON AGE

New York, Thursday, September 23, 1909.

Stevens-Duryea Auto Engine Testing.

Utilization of the power developed by automobile engines under test in the driving of machinery used in the manufacture of more engines is the ingenious practice of the Stevens-Duryea Company at its plant at Chicopee Falls, Mass. Usually the work done by engines during testing is wasted. The oldest and commonest way is to absorb it in a prony brake, and the more modern way is to first convert the energy into electricity and dissipate it in a water rheostat or other resistance. The scheme followed in this case is much the same as the latter up to the point of disposing of the current, but it also has its individualities in certain of the details. Principally unique, however, is the turning of the current into the shop power supply mains, which is made worth while in this plant because of the number of engines usually under test at one time. The equipment in the testing room consists of 18 electric generators, each mounted at one end of a stand on which a four or a six cylinder engine may be placed and connected with the water, gasoline and ignition and generator systems installed in the testing room.

View in the Testing Room at the Stevens-Duryea Company's Plant, Chicopee Falls, Mass.

Each unit power plant is complete with all equipment when received from the motor, clutch and transmission assembling room, and after being placed on one of the testing blocks by means of a hand hoist with trolley running on an overhead I-beam, and connected to the different systems, the engine is started without cranking by using the generator as a motor. It is then run under its own gas without load for 2½ to 3½ hr., after which the generator is cut in on the factory power line and the test run continued for 10 hr. under loads varying with the model of the engine being tested. At this point the engine is taken apart, and every cylinder, piston, ring, bearing, cam and gear is inspected by experts. When found up to standard the motor is reassembled and again started and run idle for 2 or 3 hr., after which it is tested for maximum power. Standards are adopted for each model, and each engine has to attain these in power and frictional resistance as determined by the readings of electrical instruments before it is passed on to the car assembling department.

The engines are run as nearly as possible under the conditions that exist in road use. The gasoline pressure is the same as in the car obtained by the use of a small tank located outside the building in which the proper level above the carburetor is maintained by the use of a ball cock interposed in the fuel line between a large 900-gal. tank and the small one. The latter is equipped with an automatic device for ringing a bell when the gasoline stops running into it, indicating that the large tank is empty, but it still holds enough to keep the motors running until the large tank can be refilled.

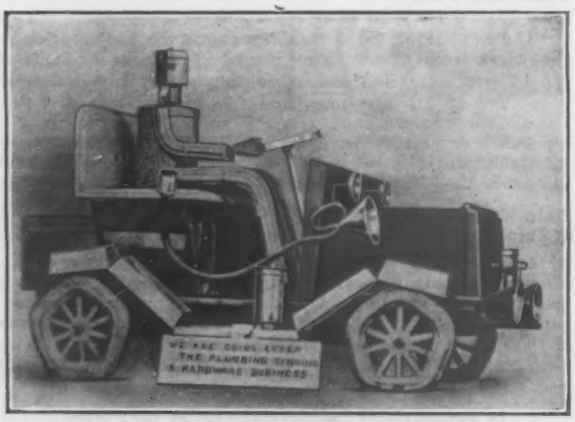
The water system is constructed so as to give the same pressure and circulation as in the finished car. At each end of the room is located a large tank provided with an overflow and supply pipes by means of which the water can be kept at a uniform temperature. These tanks are connected with each other at the top and bottom, and the engines on the blocks are supplied by pipes at each end and in the middle of the room. The return is taken entirely from the center and put through a centrifugal pump and by-pass, so that whether 1 or 18 motors are running the flow of water is the same through each engine. The exhaust system is as carefully worked out.

Stalker Hardware Co.'s Automobile Window Display.

Gasoline Engine in the Basement Furnished Power to Revolve the Wheels.

THE Hardware trade may be depended upon to take up the latest fad as a subject for show window displays. Teddy Bears have had their day, Automobiles and Airships seem to be popular now, Eskimos and Cook-Peary cotton North Poles will soon arrive, and after the Hudson-Fulton celebration in New York City battleships may become as prime favorites for window trim as they were after Dewey's fight in Manila Bay. No other line of merchandise lends itself so admirably to such displays.

The accompanying illustration represents an Automobile displayed in the window of the Stalker Hardware Company, Algona, Iowa. The makeup was as follows: The frame of the Auto, 2 x 5½ ft., stood on a platform 15 in. high. The wheels had 3-in. Conductor Pipe Elbows for tires and an axle made of ¾-in. Gas Pipe. Pulleys attached to the Axles were belted to a small Gasoline Engine in the basement, below the window, which furnished the motive power to revolve the Wheels. This introduced a moving feature into the display, which is always attractive to onlookers. The running board of the machine was a Slaw Cutter; Angel Food Tins were used as shields to protect the Wheels; a Hot Air Side Wall Register did duty as the Radiator, with a Gasoline Oven as housing over the engine.



Going After Business in the Stalker Automobile.

For head lights there were two Funnel Washing Machines, and for emergency lights two Soap Dishes. The steering wheel was a 10-in. Cake Tin and the stem to the wheel Brass Tubing. A High Back Porcelain Sink, set on Roasters, answered for a seat and a Bread Box for the tool box. The "honk honk" was a small Funnel and Tin Oiler attached to either end of a piece of Rubber Hose.

The driver was fireproof, having a Galvanized Oil Can for body, arms and legs of Conductor Pipe and Elbows; neck, a Pint cup, and head, a ½-gal. Tin Pail. This was decorated with a Tea Kettle Spout for nose, Picture Nails for eyes, Tea Strainers for goggles, a small Skimmer for cap and Drawer Pulls supplied the ears. Although the wheels revolved rapidly no arrest for exceeding the Iowa speed limit is recorded.

THE warehouses of Reilly Bros. & Raub, Lancaster, Pa., were destroyed by fire on the 5th inst., the loss being in the neighborhood of $50,000. As only smoke entered the main store, little or no loss was suffered there. There is a blanket insurance on the entire stock of $81,000 and an insurance of $45,000 on the buildings. This being the season of the year when the firm was fully stocked up, it is estimated that the goods on hand amounted to a total value of $100,000.

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